A Guide to the Products of NASA's Learning Technologies Project

Summer 1999

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Online versions of this 1999 LTP Product Guide are available at NASA's Learning Technologies Web site:

Adobe Acrobat PDF file: http://learn.ivv.nasa.gov/products99/guide99.pdf
HTML version: http://learn.ivv.nasa.gov/products99

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With each new day, remarkable high technologies (the Internet, the World Wide Web, and the myriad of applications accompanying them) seem to replace the existing order of things, forever altering the status quo in terms of business, communication, and learning.

NASA's Learning Technologies Project (LTP) has embraced, and in many ways helps lead, this technological revolution.

NASA is reaching into the classrooms of America to make a difference in math, science, and technology education. The Internet is being used as the primary medium for live interactions with scientists, virtual electronic field trips, collaborative projects, and distance learning activities.

NASA's cooperative agreement notice titled "Public Use of Earth and Space Science Data over the Internet" has demonstrated mature K-12 education products and innovative digital library technologies. Activities through NASA Regional Outreach Centers and education cooperative agreements continue to make an impact on education and information delivery over the Internet.

LTP has developed a digital audio network testbed that initially supports thousands of users world wide. This audio-based Internet infrastructure is used to further distance learning technologies and communicate NASA science. Interaction and training is provided through NASA's Learning Technologies Channel.

NASA's Learning Technologies Project is part of the High Performance Computing and Communications (HPCC) program located at the NASA Ames Research Center. The HPCC is part of the larger federal initiative, the Committee on Computing, Information, and Communications (CCIC). The CCIC's mission is to accelerate the development, application, and transfer of high performance technologies to America's engineering and scientific communities. This mission includes the propagation of the Next Generation Internet.

LTP is NASA communicating science: letting students and teachers know that while imagination starts at the ground floor, the sky is not the limit.

Mark León
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NASA's Learning Technologies Project
High Performance Computing and Communications
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Ames Research Center
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This volume is a compilation of the products produced by the LTP. Several indexing categories are provided.

Acknowledgments

Thanks to the principal investigators and their teams for in preparing these pages.

Products are organized according to grade level.

Products are organized according to four NASA Strategic Enterprises.

Products are organized by the major focus areas as defined by the LTP.

The NASA K-12 Education Outreach center projects develop products and applications that are widely disseminated throughout the educational community. NASA activities are used to inspire students to undertake science, engineering, aerospace, and computer careers, as well as to develop Internet-based curricula for interactive science projects. NASA has a variety of interactive projects connecting classrooms with ongoing science and engineering work.

The K-14 Aeronautics projects develop new ways to teach science, mathematics, engineering, and aeronautics in grades K-14 using the Internet. Supporting material is also being developed to encourage students with physical disabilities and minority students to pursue careers in aeronautics and engineering.

The Remote Sensing Public Access Center's mission is to increase the public's access, via the Internet, to space observations of Earth, the solar system, and the universe beyond. RSPAC's Web site showcases LTP projects and informs the public about NASA science.

The two major products created by RSPAC are:

The Digital Library Technology (DLT) projects create electronic multimedia libraries that are easily accessible to large numbers of users and require new and innovative technologies. These libraries initially support the long-term needs of a variety of NASA pilot projects, and will eventually be distributed to millions via the Internet.

The LTP Special Projects (SP) provide broad public access to remotely sensed images and data over computer networks. This information is used in education, science and engineering, environmental protection, disaster relief, and weather prediction. Public use, via the Internet, of Earth and space science information from NASA and other sources has been greatly increased. Schools, businesses, and the public are now able to access these data.

NASA's Learning Technologies Project (LTP) Web site is the place to go to find information on the many efforts that demonstrate how newly emerging communication technologies can be used to bring NASA's science and engineering data to schools and the public.

System Requirements

A World Wide Web browser

Access

http://learn.ivv.nasa.gov

Additional Information

Send e-mail to learn@rspac.ivv.nasa.gov

Visit http://learn.ivv.nasa.gov

Learning Technologies Channel

The purpose of this Quest project activity is to demonstrate how Internet-based classroom experiences can be enhanced with access beyond a simple dial-up connection. As with all of our projects, the Learning Technologies Channel (LTC) is designed to contribute to the experiences of teachers and students as they use the Internet in their classrooms.

The LTC is a location on the Internet where teachers can participate in online courses and remotely attend some NASA teacher workshops and seminars. A primary focus of the LTC is to broaden the uses of the Internet to include in-service teacher training.

Content on the LTC provides access to an immense field of projects and information. The LTC works with a wide range of partners to host many different kinds of events. Regularly scheduled courses and programs on the LTC are produced for Internet users with many different levels of connectivity and computer capability. Users with a 14.4Kbps modem connection and RealAudio installed, are able to listen to events and watch the LTC Webcam. Users with a 28.8Kbps or higher connection and RealMedia capability, can watch the video of the LTC presentations. Interaction with presenters and experts is provided via a QuestChat chat room.

Format for events

- Live lectures
- Interactive workshops
- Virtual field trips to remote locations

Some Examples

- Sharing NASA 101 - A six part teacher-training series
- And Now... From a Submarine! - Live audio from underwater
- Live Tour of the Space Station Mockup and Training Facility
- Astrobiology Lecture: “The Universe In Your Backyard!”

Learning Technologies Channel

System Requirements

Access to the Web
RealAudio capability (optional)
RealMedia capability (optional)
CU-SeeMe capability (optional)
MBONE capability (optional)
NASA TV access (optional)

Access

Schedule of live events. (Updated monthly.)
Archive of past events. (Updated monthtly.)

Additional Information

Introductory Web site: http://quest.arc.nasa.gov/ltc/index.html
Project Manager: Andrea McCurdy (andream@quest.arc.nasa.gov)

QUEST

The “Quest” World Wide Web server is the home of the NASA Ames Research Center’s Quest project, whose mission is to provide support and services for schools, teachers, and students to fully utilize the Internet and its underlying information technologies as a basic tool for learning. Quest provides access to a wealth of resources for educators, including:

- Sharing NASA - a series of online, interactive projects designed to connect students to the people and projects of NASA
- Learning Technologies Channel - Internet location which allows educators in their own home or school to attend and fully participate in remote events such as lectures, conferences, courses, and field trips
- Information on our Internet video series - designed to help teachers, administrators, and community members bring the benefits of the Internet into K-12 classrooms
- Information on using the Internet in the classroom
- Grant information
- Links to other schools online
- Links to other online educational resources
- and more...!!

System Requirements

A World Wide Web browser

Access

http://quest.arc.nasa.gov

Additional Information

Send e-mail to info@quest.arc.nasa.gov

SHARING NASA

Sharing NASA, part of the Quest project, focuses on the enthusiastic people of NASA who live and breathe the space program every day. Over the Internet, these people come alive for K-12 classrooms. Students feel like they've not only read about exciting events, but that they've met the people involved.

Also, classrooms work together over the Internet and teachers plug into a support network of peers. Lots of online curriculum supplements help teachers integrate science and technology issues into their lessons. These projects also offer many opportunities to enhance reading, writing, and creative expression activities.

Projects change over time, but something great is always happening. Currently, our best projects include:

- Space Team Online: Join the men and women who make the space shuttle fly and those making the International Space Station a reality
- Aero Design Team Online: Learn why and how airplanes fly, and meet the scientists and engineers that design and improve them
- Women of NASA: Amazing females at NASA as role models for young students

System Requirements

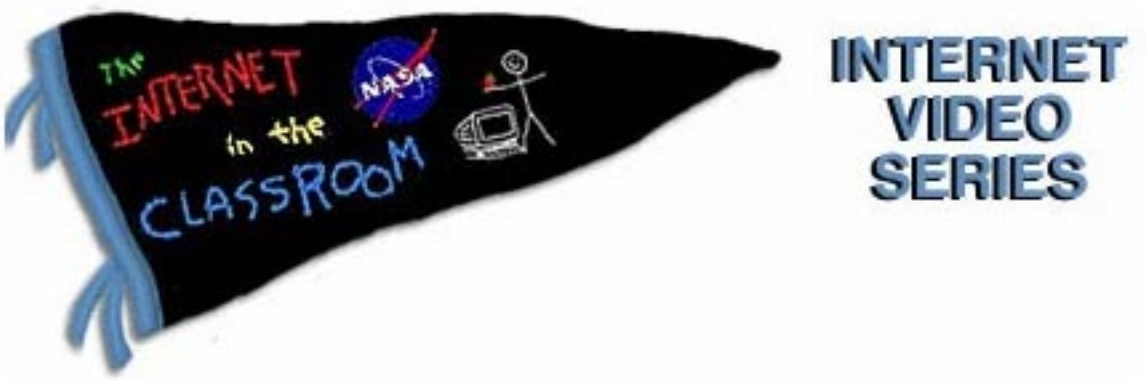
These projects are designed to work across a broad range of connectivity. For teachers whose classes have no Internet access, text e-mail sent to a home computer is available. A Web connection in the classroom provides more service. Advanced network users can plug into network video (CU-SeeMe) and special WebChat options (Java enhanced).

Access

To stay abreast of new offerings, join the Sharing NASA mail list.
Send an e-mail to: listmanager@quest.arc.nasa.gov
In the message body write exactly these words: subscribe sharing-nasa
Also, visit the Web site at http://quest.arc.nasa.gov/interactive

Additional Information

First, join the maillist and visit the Web site.
If questions remain, send e-mail to Marc Siegel (msiegel@quest.arc.nasa.gov).

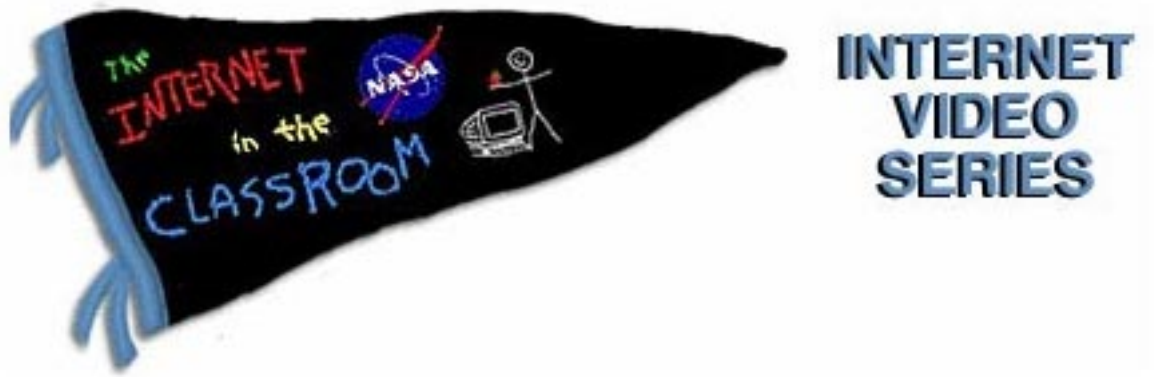


This series of Quest project videos is designed to help teachers, administrators, and community members bring the benefits of the Internet into K-12 classrooms.

Global Quest: The Internet in the Classroom is designed to inspire you and your community to explore further this exciting resource! The twelve-minute format makes it an excellent tool for Internet advocates to help them convince colleagues to invest effort in the technology.

Connecting to the Future video and handbook were co-produced with the US Department of Education's National Center for Education Statistics. The information in the video and handbook focuses on the idea that connecting to the Internet using a single dial-up connection may not prove too difficult, but connecting your entire school site to the network is a very complex task.

Global Quest II: Teaching with the Internet features teachers telling teachers about the issues and benefits involved in making this tremendous resource a part of classroom curriculum. The video's twenty-two-minute format allows teachers to tell how the Internet has strengthened their classroom activities. The Web site is designed to further introduce the teachers featured in the video, as well as to point to the resources, projects, ideas, applications, and guides that they discuss in the video.



System Requirements

A television
A VCR
Web access (optional)

Access

All Videos

Can be ordered through NASA CORE: (216) 774-1051 x293
Copies made at NASA Educator Resource Centers
Duplication rights granted

Connecting to the Future Handbook

Can be ordered through NASA CORE: (216) 774-1051 x293
Accessed via the Web: http://quest.arc.nasa.gov/handbook/toc.html
Free copies made at NASA Educator Resource Centers
Duplication rights granted

Global Quest II Web Site

Web address: http://quest.arc.nasa.gov/globalquest2

Additional Information

Online information: http://quest.arc.nasa.gov/top/video1.html
Project Manager: Andrea McCurdy (andream@quest.arc.nasa.gov)

Web-Enhanced Learning Environment Strategies: Development, Implementation & Evaluation

The Dryden Learning Technologies Project is a collaboration between NASA's Dryden Flight Research Center (DFRC) and Pennsylvania State University. This is a multiyear project which begins with an analysis and needs assessment relative to the Internet in the classroom, and concludes with an impact study of systemic reform of teaching practices in K-12 classrooms as a consequence of Web-based instructional sites. The impact of NASA's Learning Technologies Projects on K-12 instruction and systemic reform of teaching practices will be central to the project.

During year one, the Analysis, Needs Assessment, and Design phases, the project: conducted an analysis of current teacher needs, school technology infrastructure, and exemplary instructional Web sites; developed models of Web-enhanced learning environments, demonstrated methods of integrating the WWW into the classroom, and addressed access limitations and different teaching and learning styles; and conducted teacher focus groups. Project goals for year two, the Development, Implementation, and Evaluation phases, include:

- Developing Web-Enhanced Learning Environment Strategies (WELES)
- Conducting focus groups; revising strategies; conducting two pilot studies; developing orientation manuals on WELES, reflection tools for teachers, and evaluation tools
- Developing a report on the feasibility of WELES, and developing a plan for a large group impact study of systemic reform.

The DFRC Learning Technologies Project is dedicated to providing a comprehensive examination of the impact of the WWW on classroom instruction. The purpose of the study is to ensure that NASA's Learning Technologies Projects adequately serve the K-12 community; are utilized consistently in K-12 classrooms; inspire students to study science, math, and technology using NASA mission-specific activities; assist students in the development of technical competence and literacy; and promote excellence in America's educational system.

Web-Enhanced Learning Environment Strategies: Development, Implementation & Evaluation

System Requirements

Some of the initial results have been published on the WWW and are available as paper documents.

Access

Online resources may be accessed through the Dryden Technical Report Server at http://www.dfrc.nasa.gov/DTRF.

Printed papers

- NASA/TP-1998-206547 “Web-Based Instruction and Learning: Analysis and Needs Assessment,” 1998
- NASA Conference Publication 3358 “The World Wide Web as a Medium of Instruction: What Works and What Doesn’t,” 1997

Additional Information

Marianne McCarthy, Ph.D.
Pre-college Education Officer
NASA Dryden Flight Research Center
E-mail: marianne.mccarthy@dfrc.nasa.gov

The Aeronautical Classroom Activities Web site contains many ready-made classroom lessons, activities, and experiments that deal with the science of aerodynamics. Use individual lessons for stand-alone labs or activities, or use them together to create a unit or module. The activities contain information on Bernoulli's principle, buoyancy, hydraulics, Newton's laws of motion, velocity, pressure, lift and other forces which act on airplanes.

System Reqirements

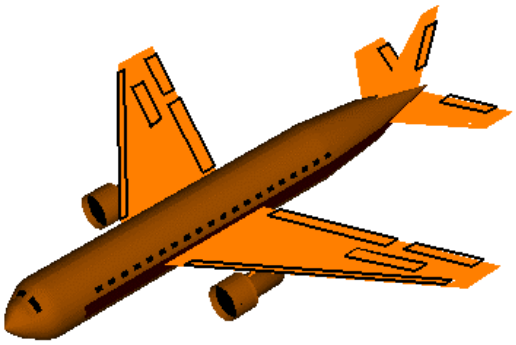
A World WideWeb browser

Access

http://www.grc.nasa.gov/WWW/K-12/WindTunnel/Activities/aeroactivities.html

Additional Information

Send e-mail to carol.galica@grc.nasa.gov
Visit http://www.grc.nasa.gov/WWW/K-12



Glenn Research Center

BEGINNER'S GUIDE TO AERODYNAMICS

This Web site was prepared at NASA Glenn Research Center to provide background information for secondary math and science teachers on the basic aerodynamics of airplanes. These slides will give you a better understanding of how airplanes work and answer the questions, "What causes the lift that gets the airplane off the runway?" and "How does a pilot control the movement of the airplane?" Students of all ages are welcomed.

Use student interest in airplanes to introduce some simple math and physics principles and problems. The problems that you can use in class will be included in square brackets — [Like this].

The format of the pages allows you to download your own copies of the information. Each slide is accompanied by a caption that explains what the slide is about and goes into some detail about the physics and math related to the subject of the slide. There are often links and references to other slides and sites where you can find additional information. At the end of each page there is a button labeled "Show Slide." Clicking on this button displays the slide alone, without the captions. The slide is oriented in such a way to give you the largest, most detailed copy. You can use your browser's print command to make your own copy of the slide without the accompanying caption. Each slide fits on a single sheet of paper.

System Requirements

A World Wide Web Browser

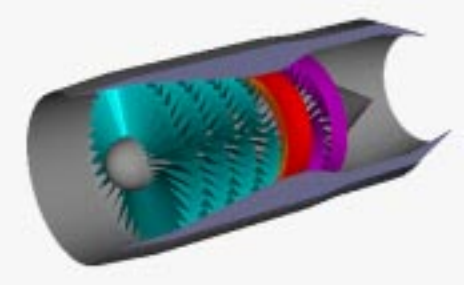
Access

http://www.grc.nasa.go v/WWW/IFMD/airplane/bga.html

Additional Information

Send e-mail to Carol.A.Galica@grc.nasa.gov

Visit http://www.grc.nasa.gov/WWW/K-12



Glenn Research Center

BEGINNER'S GUIDE TO PROPULSION

This Web site was prepared at NASA Glenn Research Center to provide background information for secondary math and science teachers on the basics of propulsion. The slides will give you a better understanding of thrust, Newton's Laws of Motion, and of different types of airplane engines. Students of all ages are welcomed.

Use student interest in airplanes to introduce some simple math and physics principles and problems. The problems for use in class are included in square brackets — [Like this].

The format of the pages allows you to download your own copies of the information. Each slide is accompanied by a caption that explains what the slide is about and goes into some detail about the physics and math related to the subject of the slide. There are often links and references to other slides and sites where you can find additional information. At the end of each page there is a button labeled "Show Slide." Clicking on this button will display the slide alone, without the captions. The slide will be oriented in such a way to give you the largest, most detailed copy. You can use your browser's print command to make your own copy of the slide without the accompanying caption. Each slide fits on a single sheet of paper.

System Requirements

A World Wide Web Browser

Access

http://www.grc.nasa.gov/WWW/IFMD/airplane/bgp.html

Additional Information

Send e-mail to Carol.A.Galica@grc.nasa.gov

Visit http://www.grc.nasa.gov/WWW/K-12

Distance Learning Workshops

The NASA Glenn Research Center offers workshops using videoconferencing technology. We have the capability to connect to most video conferencing networks, as well as CUSeeMe desk-top conferencing technology. The Distance Learning Project incorporates Web-based instruction into its workshops on topics including: on-line instructional manuals, a proficiency test tutorial, aeronautics lesson plans, and a "textbook" of slides on Airplane Aerodynamics and Propulsion.

Current videoconferencing workshops include information on the following topics:

- Aeronautics
- Careers in the field of Aerospace
- Rockets
- Propulsion
- Space Transportation
- Space Science
- NASA Educational Internet Sites
- Human Exploration and Development of Space
- Mission to Planet Earth
- Space Communications
- Robotics

System Requirements

A World Wide Web browser

NASA Glenn's videoconferencing system is compatible with the following video protocols: H.320 (most equipment meets this standard), H.CTX, H.CTXP, CTX, and CTXP. Conferences can be viewed with PictureTel, VTel, or CLI equipment.

Access

http://www.grc.nasa.gov /WWW/K-12/CoE/Coemain.html

Additional Information

Send e-mail to Carol.A.Galica@grc.nasa.gov

Visit http://www.grc.nasa.gov/WWW/K-12

FOILSIM

Basic Aerodynamics Software

FoilSim is an educational software package that was created at the NASA Glenn Research Center to instruct students in the basics of aerodynamics. The software contains two main parts, a baseball pitch and a wing-airflow simulator. Lessons prompt students to engage in problem solving and discovery. The software was created both to cultivate a more thorough understanding of the research being done at the NASA Glenn Research Center, and to fill a critical need for intuitive tools that supplement and enhance math and science curricula.

System Requirement

Windows 95, Windows NT or Macintosh

Access

http://www.grc.nasa.gov/WWW/K -12/aerosim/

Additional Information

Send e-mail to Carol.A.Galica@grc.nasa.gov

Visit http://www.grc.nasa.gov/WWW/K-12

NASA Glenn hosts Professional Development Workshops for pre-service and in-service teachers. The six-day workshop offers a unique opportunity for teachers to learn more about the Glenn Research facility directly from NASA researchers. Undergraduate or Graduate credit is offered. The objectives of the workshops are:

To provide computer training to teachers and to help them integrate computer technology into the classroom.

To apply the skills learned through the computer training to create NASA-related classroom materials. The materials are shared with teachers nationwide on the LTP Web site or in workbook format through area AccessNASA Educator Re source Centers.

System Requirements

A World Wide Web browser

Access

http://www.grc.nasa.gov/WWW/K-1 Summer_Trainingteacher_training.html

Additional Information

Send e-mail to Carol.A.Galica@grc.nasa.gov
Visit http://www.grc.nasa.gov/WWW/K-12

The NASA Glenn Research Center's Learning Technologies Web server contains computer instruction tutorials. Topics include Introduction to Macintosh, Introduction to the Internet, some basic software packages, and how to incorporate computers into curricula. Some of the titles are "Using the Internet for Science," "Using Interactive Physics in the Classroom," and "Delta Graph Pro for the Educator." The instructional materials can be used for independent learning of computer skills. They can also be used as ready-made lesson plans.

System Requirements

A World Wide Web browser

Access

http://www.grc.nasa.gov/WWW/K-12/Basic_Tutorials/
Training_Documentation.htm l

Additional Information

Send e-mail to carol.galica@grc.nasa.gov

Visit http://www.grc.nasa.gov/WWW/K-12

Three NASA Glenn Summer Computer Workshops are held each summer. There is a workshop for high school teachers, one for middle school teachers, and one for elementary school teachers. Each is two weeks in duration. The first week the participants receive hands-on computer training in a variety of software applications. The second week participants are required to create a classroom lesson or activity which incorporates the computer applications they learned during the first week. These lessons are located on the NASA Lewis K-12 Web server. The lessons cover a wide range of topics and grade levels.

System Requirements

A World Wide Web browser

Access

http://www.grc.nasa.gov/WWW/K-12/Summer_Training/summer.html

Additional Information

Send e-mail to carol.galica@grc.nasa.gov
Visit http://www.lerc.nasa.gov/WWW/K-12

NASA Goddard Space Flight Center's High Performance Computing and Communications program/ Learning Technologies Project has two separate Web sites.

The HPCC/LTP K-12 project's main Web site assists K-12 Earth and space science educators with appropriate classroom links to the Internet and other links of general interest to the K-12 science community.

The Educator Resource Center Web site serves K-12 educators by providing NASA resources for the development of aerospace education programs and projects.

System Requirements

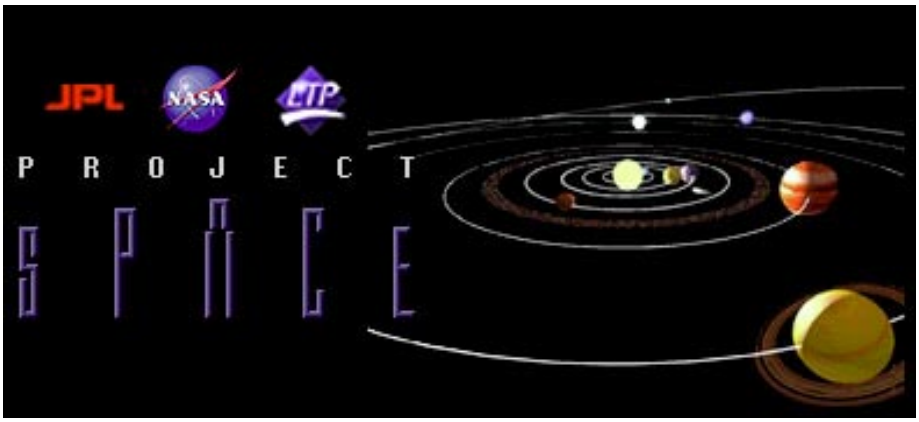
A World Wide Web browser (Some of the simulations and games require Java.)

Access

http://hpcc-k12.gsfc.nasa.gov http://pao.gsfc.nasa.gov/gsfc/educ/trl/welcome.html

Additional Information

Send e-mail to James.R.Fisher.1@gsfc.nasa.gov

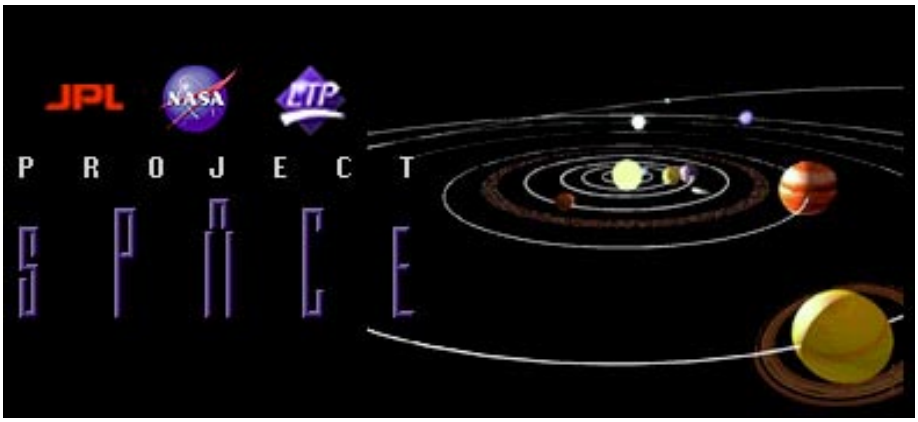


Project SPACE (Sun, Planets, Asteroids, Comets, Exploration) is an Educational Technology Program of NASA's Jet Propulsion Laboratory which provides quality curriculum support resources for K-12 students and educators using scientific data sets and new technologies acquired through space exploration. The Project SPACE Program exposes educators and students to new curriculum models, new teaching methodologies, extensive and variable technologies and their classroom application. The Project SPACE Program Model consists of five Curriculum Support Models, which can be used together or separately.

1. Curriculum Support Products
2. Website On-line Resources
3. Interactive Multimedia Simulations
4. Educator Inservices
5. Technology and Science Applications Classrooms:
   -Applied Technology and Science Room
   -Internet Communications Room
   -Interactive Multimedia Simulations Room

The goal of The Project SPACE Program is to develop curriculum support models and products that integrate space exploration, scientific data sets and new technologies into educational support resources that are aligned to the National Science Standards topics and themes educators are required to teach. By doing this, Project SPACE is also supporting the process of systemic change currently underway in American classrooms.

The Project SPACE Web site provides educators with a wide variety of resources they can use in their classrooms. The website contains curriculum support resources for K-12 educators and students in the form of resource libraries and links. Every month new resources are added to the libraries which include classroom Activities, Images, Movies, Educational Games, New Discoveries, and Background information centered on the Solar System. The Web site also directly supports the other Project SPACE Curriculum Support Models to demonstrate an integrated working model for disseminating scientific knowledge gained through NASA/JPL Space Missions. The Web site's wealth of scientific data about our Solar System has been carefully aligned with the National Educational Science and Math Standards, California Science Framework Themes and Topics to ensure maximum value to educators nationwide. The Project SPACE Web site is in the process of a major upgrade which will add Shockwave interactive elements scheduled to be on-line in July, 1999.



System Requirements

A World Wide Web browser (Future homepage elements will require Java and Shockwave support.)

Access

http://learn.jpl.nasa.gov/projectSPACE

Additional Information

Send e-mail to michael.a.garcia@jpl.nasa.gov

The Telescopes in Education (TIE) program brings the opportunity to use a remotely controlled telescope and charge-coupled device (CCD) camera in a real-time, hands-on, interactive environment to students around the world. TIE enables students to increase their knowledge of astronomy, astrophysics, and mathematics, improve their computer literacy, and strengthen their critical thinking skills.

The TIE project currently utilizes a science-grade twenty-four-inch reflecting telescope located at the Mount Wilson Observatory, high above the Los Angeles basin in the San Gabriel Mountains of Southern California. The telescope has been used by students in grades K-12 to observe galaxies, nebulae, variable stars, eclipsing binaries, and other ambitious projects and experiments. Through project SCHOLAR (Students Conducting Hands-On Learning in Astronomy Research), TIE will enable teams of students to conduct actual astronomy research in collaboration with professional astronomers through observations made with the Mount Wilson telescope.

The twenty-four-inch telescope and CCD camera located at the Mount Wilson Observatory can be operated remotely by educators and students from computers in their classrooms via modem and special astronomy software. Images can be downloaded to a remote user of the telescope in five minutes or less. (The time depends upon the speed of the user's modem.) These images can be stored in the user's computer for later enhancement and study. Use of the TIE system is without charge except for the purchase of *The Sky: Remote Astronomy Software*, which controls the telescope. The software also serves as an excellent stand-alone educational astronomy program. The cost of the software is discounted for educators and students using the TIE telescope.

System Requirements

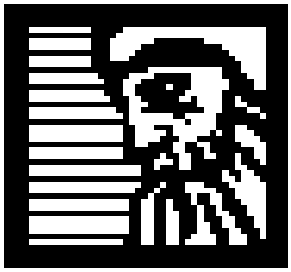
IBM PC-class computer (486 or better) or an Apple PowerMac running SoftWindows
9600-baud or faster modem
World Wide Web Browser
SVGA monitor and driver card (necessary for quality image processing)
At least 4MB of RAM
The Sky: Remote Astronomy Software by Software Bisque

Access

You can visit the TIE homepage at http://tie.jpl.nasa.gov.

Additional Information

Telescopes In Education/Mount Wilson Institute
(818) 793-3100
tie@mtwilson.edu
PO Box 24
Mount Wilson, CA 91023 USA



ILIAD

Your Personal Offline Search Engine

ILIAD searches the Internet offline via email or the Web. If you have e-mail - you can search the Web!

Using agent technology, ILIAD provides intelligent, selective access to Internet information through two avenues: a simple low-cost email interface, and a Web-based form.

ILIAD by e-mail is optimal for users who have no Web access, are vision impaired, or prefer quick searching the Web via the command line.

ILIAD by Web also searches the Internet and provides the same time-saving benefit. Searches are submitted and then performed offline. The search results are e-mailed to review at your convenience.

E-mail your request to: iliad@prime.jsc.nasa.gov
The format required is:

Subject: iliad query
?Q : your query keywords

System Requirements

An e-mail account or an Internet connection and a Web browser

Access

For info, send e-mail to iliad@prime.jsc.nasa.gov with the Subject: start iliad or visit this Web site: http://prime.jsc.nasa.gov/iliad/

Additional Information

Contact the Johnson Space Center Learning Technologies Project (http://prime.jsc.nasa.gov) or Stephanie Smith - slsmith@gothamcity.jsc.nasa.gov

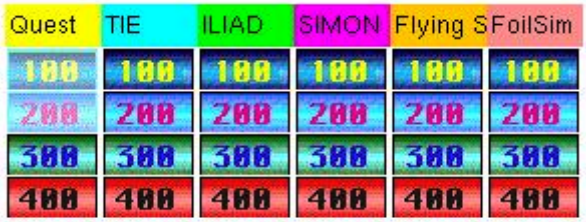
The NASA Qwhiz

A Real-Time, Multi-Player Web Activity

A K-12 Teaching Technology Tool

The Qwhiz is a real-time, multi-player Web game for math or science teachers and students. Teachers can use this Internet technology to evaluate student learning and fulfill instructional technology teaching requirements by making Qwhiz a part of student activities. Students can take a Qwhiz against the computer or other students to study class materials, learn technology skills, and they can make Qwhizzes for others in this student-centered learning environment.

Included at the Qwhiz site is a Qwhiz Maker to create the gameboard matrix and question sets plus a Qwhiz Miner to search and retrieve Internet information. These three components provide a teacher or student the tools to harvest Internet data, formulate test material, and present it in a novel and challenging manner.



System Requirements

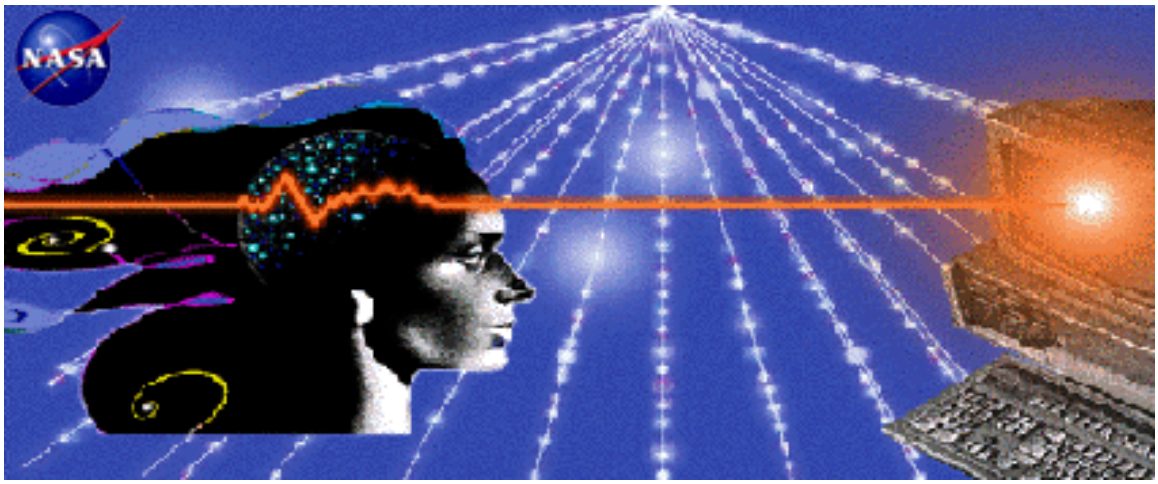
An Internet connection, Netscape 4.0+

Access

http://prime.jsc.nasa.gov/Qwhiz/

Additional Information

Contact the Johnson Space Center Learning Technologies Project (http://prime.jsc.nasa.gov) or Stephanie Smith - slsmith@gothamcity.jsc.nasa.gov



SIMON

School Internet Manager Over Networks

SIMON is a unique suite of Internet tools for K-12 teachers and students that facilitates Internet searching and the use of Web-based materials in the school.

SIMON features include:

Search & Retrieve Functions: off-line searching, off-line browsing of search results, downloading of Web sites

Lesson Building Functions: off-line browsing of Web sites, lesson builder with Web page selector, lesson editor

Lesson Library Management: off-line lesson library, automatic or manual lesson addition, lesson-sharing utilities

System Requirements

A Macintosh Local Area Network, Netscape 3.0+, one account with an Internet Service Provider

Access

http://prime.jsc.nasa.gov/SIMON/Version3/

Additional Information

Contact the Johnson Space Center Learning Technologies Project (http://prime.jsc.nasa.gov) or Stephanie Smith
slsmith@gothamcity.jsc.nasa.gov

Virtual Science Mentor Program

The Virtual Science Mentor Program (VSM) uses desktop video to connect middle school students in Southwest Florida to Kennedy Space Center's scientists and engineers. The goal is to support the local Florida program as well as to develop products, both administrative and academic, for distribution to other NASA Centers and to educational institutions nationally.The program is carried out in collaboration with the State of Florida Technological Research and Development Authority, and Florida Gulf Coast University and the Intel Corporation.

System Requirements

An Internet connection or ISDN connection
For system requirements for local educators, please contact Gregg Buckingham or Brandt Secosh.

Access

http://www.pao.ksc.nasa.gov/kscpao/univ/vsm/vsm.htm

Additional Information

contact Greg Buckingham at 407-867-7952
or
Brandt Secosh at Brandt.Secosh@ksc.nasa.gov

EarthKAM Support

NASA Langley's Office of Education and Learning Technologies Project are supporting NASA's EarthKAM project which allows students to participate in scientific investigations that include taking images from space-based cameras. Find out more about this exciting project here!

System Requirements

An Internet connection and a Web browser

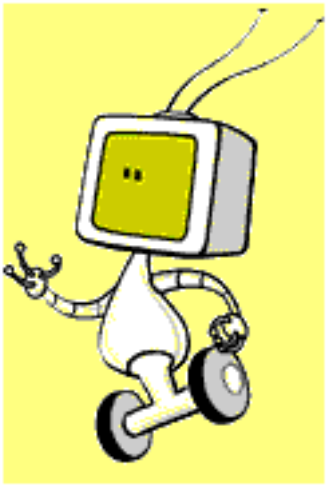
Access

http://k12unix.larc.nasa.gov/earthkam/

Additional Information

Visit http://k12unix.larc.nasa.gov/

Send e-mail to info@k12unix.larc.nasa.gov



Kids Corner

As part of NASA Langley's online presence, the Learning Technologies Project and Office of Education are collaborating on a special section of Langley's homepage, Kids Corner, just for students. While this site is currently under construction, feel free to stop by and see how things are progressing!

System Requirements

An Internet connection and a Web browser

Access

http://wwwd.larc.nasa.gov/kids/

Additional Information

Visit http://k12unix.larc.nasa.gov/

Send e-mail to info@k12unix.larc.nasa.gov

MarsQuest

Your 4th through 8th grade students can be a part of this exciting online project and learn about Mars science and missions, as well as planetary exploration in general. This project will continue to evolve as NASA continues to send unmanned missions to Mars over the next several years. After successfully completing each level, students will have the opportunity to remotely control a small robotic vehicle.

System Requirements

An Internet connection and a Web browser

Access

http://k12unix.larc.nasa.gov/mars/

Additional Information

Visit http://k12unix.larc.nasa.gov/
Send e-mail to info@k12unix.larc.nasa.gov

NASA CONNECT

NASA CONNECT is a series of, 30-minute instructional programs that use NASA projects, facilities, and researchers to enhance the teaching of elementary (grades 4-5) and middle school (grades 6-8) math and science. NASA CONNECT links math and science concepts and skills to the workplace, joins classrooms with NASA researchers, and supports national math and science standards. Each program includes a lesson, a classroom experiment, and a Web-based, on-line, interactive component. NASA CONNECT is produced by the NASA Langley Office of Education, with support for online activities provided by the Learning Technologies project. All NASA CONNECT resources are free; there are no fees or charges associated with the program or Web site. Educators are encouraged to tape the broadcast (which are available through many PBS affiliates and NASA TV) and copy the teacher materials.

System Requirements

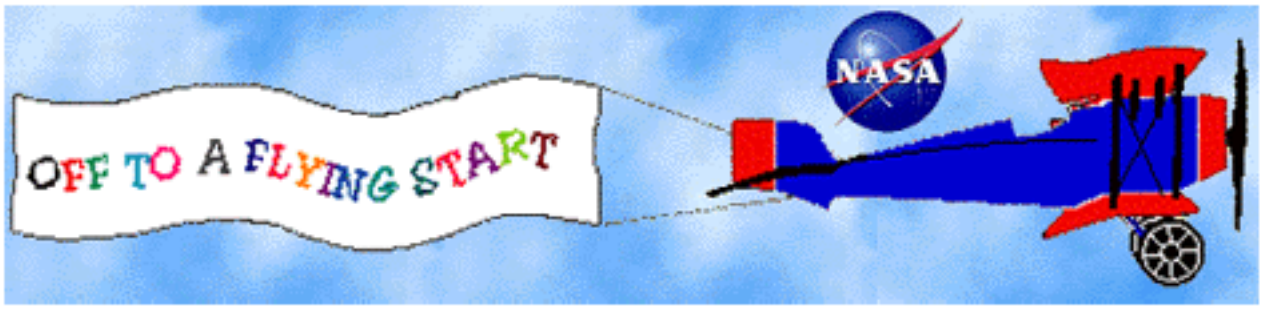
Television
Internet connection and Web browser

Access

http://edu.larc.nasa.gov/connect/

Additional Information

Send e-mail to info@k12unix.larc.nasa.gov



Off to a Flying Start, a NASA Langley Learning Technologies Project, is a K-12 online telecommunications project that connects students across the globe with the excitement of aeronautics to provide learning opportunities in math and science. The project will be open for participation from October 1 to May 31 of each year, with the length of project participation determined by individual classroom teachers. Off to a Flying Start consists of three modules: Introduction to Flight, where students learn basic principles related to airplane design and the theory of flight; Flying the Falcon Flyer, which allows students to build and fly their own gliders; and Experimental Design, which builds on the results obtained with the Falcon Flyer, allowing students to create and test their own unique airplane designs.

Students will:

Use scientific reasoning to design and construct their own planes.
Participate in an Internet-based collaborative project.
Investigate, describe, and share results.
Discuss how and why airplanes fly.
Identify the parts of a plane.
Collect and graph data.

System Requirements

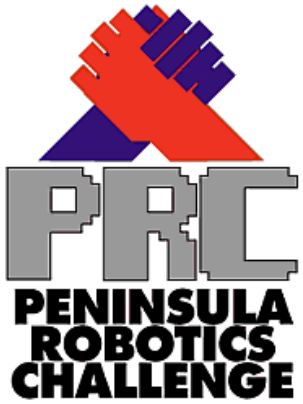
An Internet connection and a Web browser

Access

http://k12unix.larc.nasa.gov/flyingstart

Additional Information

Visit http://k12unix.larc.nasa.gov/
Send e-mail to info@k12unix.larc.nasa.gov



The Peninsula Robotics Challenge (PRC) brings practical understanding of math, science, and engineering to middle school students, while generating enthusiasm for pursuing these areas in future studies through a problem-based engineering design competition. Teams of students from middle schools across the country design, build, program, and test their own autonomous (self-operating) robots and then compete head-to-head with robots designed by other schools within their region.

The PRC is designed to be co-curricular, integrated into a variety of classroom subjects. It extends beyond the construction of a robot to include written and oral presentations as well as a required mentorship involving elementary-age students from the school's local area. Teams can consist of any number of students, although 3-5 students are responsible for officially representing their team during the final challenge event.

Teams use a robot-building kit of parts which includes various structural parts, motors, and sensors, along with other materials as well as a programmable controller. Student use a graphical programming language called ROBOLAB to program the control system for their robot.

Requirements:

As opposed to many LTP programs, this one is not a strictly online offering. The challenge documents are distributed online, but the actual robot design and construction occurs at local sites around the country. To implement the PRC in your area you will need the following:

- ® Regional sponsor to organize the final event with multiple schools
- ® Adult sponsors to assist students
- ® Robot building kit (details change each year, but cost is approximately $400/team)
- ® PC or Macintosh computer available for robot programming

System Requirements

An Internet connection and a Web browser

Access

http://k12unix.larc.nasa.gov/prc/

Additional Information

Send e-mail to info@k12unix.larc.nasa.gov

MARSHALL SPACE FLIGHT CENTER

NASA

Earth and Space Science Curriculum

Marshall Space Flight Center's (MSFC) Learning Technologies Project coordinates the pilot testing in Alabama of the 43 Earth and space science investigations developed by Maryland teachers at the Goddard Space Flight Center (GSFC) for grades 5-8 and 9-12. These new resources will be placed in a standardized format and made available electronically as part of GSFC Learning Technologies Project.

MSFC is working in cooperation with the Alabama Supercomputer Authority (ASA), which is a state-funded corporation founded in 1989 to operate the Alabama Supercomputer Center (ASC) and the Alabama Research and Education Network (AREN). ASA provides supercomputing time and related resources to Alabama's academic researchers and industry, facilitating research in advanced scientific and engineering disciplines. The ASA network, AREN, provides Internet connectivity to state government, industry, higher education and K-12 systems within the State of Alabama. MSFC will conduct an introductory workshop for the Earth and space science web module pilot teachers in cooperation with AREN. MSFC will also coordinate video conference feedback sessions with the scientists and designers at the conclusion of the pilot testing period. These sessions will utilize the AREN Teacher Training Sites across Alabama.

The project is conducted in partnership with Goddard Space Flight Center's Learning Technologies Project, the Mission to Planet Earth Education Office, the Alabama State Department of Education, the University of Alabama in Huntsville and the Alabama Supercomputer Authority which runs AREN.

System Requirements

An Internet connection and a Web browser

Access

Access through GSFC LTP project.

Additional Information

Contact Jeff Ehmen: jeff.ehmen@msfc.nasa.gov

“From a Distance” is a Web site at Stennis Space Center designed by educators. It contains lesson plans with links to other informative remote sensing Web sites and serves as an introduction to lesson plans in remote sensing.

System Requirements

An Internet connection and a Web browser

Access

http://education.ssc.nasa.gov/ltp/

Additional Information

Contact Georgia Hackney at 228-688-3866
Email: georgia.hackney@ssc.nasa.gov

Children often believe that having an interest in science and sports is a contradiction. Now a unique, interactive NASA Learning Technologies project on the World Wide Web is creating a bridge for bringing science and sports together in children's lives. Aerodynamics in Sports offers a gateway to basic principles of physics, math and aerodynamics through the study of one of the world's most exciting and popular sports: tennis!

From our home page students can follow as our research team, composed of top NASA aerodynamicists, and other physicists, and sports scientists investigate these and other fascinating questions, by studying the stars in the modern game.

The project begins with an exciting new definition of the sport: tennis is the ability to make a tennis ball "fly" on a very specific path: over the net and inside the boundaries of the tennis court!

Learn about the leading-edge NASA technologies that are used in sports science. Read about our exciting research project conducted at center court of the U.S. Open! Watch what happens over the Internet when the team tests a tennis ball in a wind tunnel at NASA's Ames Research Center. See a computational fluid dynamics simulation of the air flow around the flying ball. Participate in live web chats and video conferences and have your questions or suggestions included in our research.

And there's more: textbook materials, student activities, lesson plans, and curriculum bridges to social studies, literature and the arts! All designed to bring young students and young athletes together for fun and education.

System Requirements

A World Wide Web browser with JavaScript or QuickTime support

Access

http://wings.ucdavis.edu/Tennis

Additional Information

Please feel free to send comments or questions to:
tennisnet@cislunar.com
or
Jani Macari Pallis, Ph.D.
Cislunar Aerospace, Inc.

The NASA ALLSTAR Network project is designed to improve the delivery and quality of aeronautics and related instruction to minority students, targeting students in grades 4-14. The laboratory uses NASA, Civil Air Patrol, and private aeronautics information resources to create materials that are accessible through the Internet. The material is also available through stand-alone kiosks at middle schools, junior high schools, high schools, and community colleges across South Florida. It has over 700 Web pages of text, including audio, photo, and video clips.

Among the topics you'll find are:

History of Flight
- Important persons in flight history
- Minorities in aviation
- Tuskeegee airmen
- Early technologies (ballooning)
- Supersonic flight

Principles of Aeronautics
- Principles of flight
- Flight atmosphere
- Parts of an airplane
- Aircraft propulsion
- Lift, drag, weight, and thrust
- Flight control
- Flight instruments
- Aircraft hydraulics

Careers in Aeronautics
- NASA
- Military
- Private industry

Aeronautics-related research includes materials from NASA (LoFLYTE and X-33) and private contributors. Discussion forums, where students' questions are answered by NASA scientists and FIU faculty, are also available.

System Requirements

A World Wide Web browser (Requires Shockwave and RealAudio support.)

Access

http://www.allstar.fiu.edu/

Additional Information

Send e-mail to Dr. Cesar Levy (levy@eng.fiu.edu).

Memphis City Schools & NASA Present

WHS Wooddale High School

NASA-AVIATION ACADEMY 2000

PURPOSE:

The primary purpose of this initiative is to create a secondary educational program that provides within its course structure a multimedia, interactive, electronically delivered curriculum. Use of current-technology computer workstations over a four year plan will encourage high school students to achieve higher levels of practical knowledge and applied skill in science, mathematics, engineering, and technology subjects. The Aviation Academy 2000 Project will accomplish this goal by providing a diverse curriculum in the field of aeronautics and through the application of data communication and information exchanges via the Internet. Aviation industry involvement with the program and a strong aviation business partnership, provides realism and credible mentors which are used to inspire students to seek further education leading to either a vocational certification, licensing certificate, an associate's degree in technical subjects, a Bachelor of Science degree, or to an advanced degree program.

System Requirements

The Wooddale Homepage and existing linked files were all developed by aviation students using Microsoft FrontPage 97 & 98, Netscape 3.0, and Microsoft Word software on PC-based IBM computers. All of the products have been tested and can be viewed using existing browsers and GIF viewing programs. The project overview and its products can be viewed over the Internet using Netscape 3.0, Microsoft Explorer 3.01, or higher browsers.

Access

The Wooddale High School "Aviation Academy 2000" homepage is located at:
http://www.mecca.org/~tschieff/AVIATION/ACADEMY/index.htm

Additional Information

Mr. Bob Archer, Principal, Principal Investigator
Voice: 901/366-2445 Fax: 901/366-2476
E-mail address: bobarcherIII@prodigy.net

Mr. Tom Schieffer, Teacher, Program Coordinator
Voice: 901/366-2440 Fax: 901/366-2476
E-mail address: tschieff@mecca.org

Now educators and children have a whole new way to look at science and aeronautics on the World Wide Web. It's a kid-friendly, interactive textbook that makes understanding basic scientific principles fascinating and fun. Through the magic of the Web and Web video, young students can see a series of experiments that use familiar parts of their everyday world — a pinwheel, a baseball, a feather — to entertain and to teach. Instead of intimidating young students with abstract concepts, the K-8 Aeronautics Internet Textbook makes understanding aeronautics as simple as flying a kite.

Come to our homepage and see the unique animations that are a gateway to the world of science for children. Click on the apple and take a knowledge bite that opens up the entire world of aeronautics: the history and mythology of flight, what makes up the air around us, why an object as large and heavy as an airplane can fly, and how aerodynamic principles influence the animal world, the world of sports, and everyday machines like bicycles.

The textbook also has a teacher's supplement with lesson plans. It has three reading levels, in both English and Spanish. The materials are adapted for deaf students through a groundbreaking graphics presentation of American Sign Language. Each lesson plan also has a series of creative links from aeronautics to literature, art, social science, and math. There's a guide that shows scientists and engineers how to work with students and their teachers in grades K-8, and a self-paced class that introduces the Net to teachers and shows them how to use it.

Stay tuned — Web chats in English and Spanish during the summer of 1998!

System Requirements

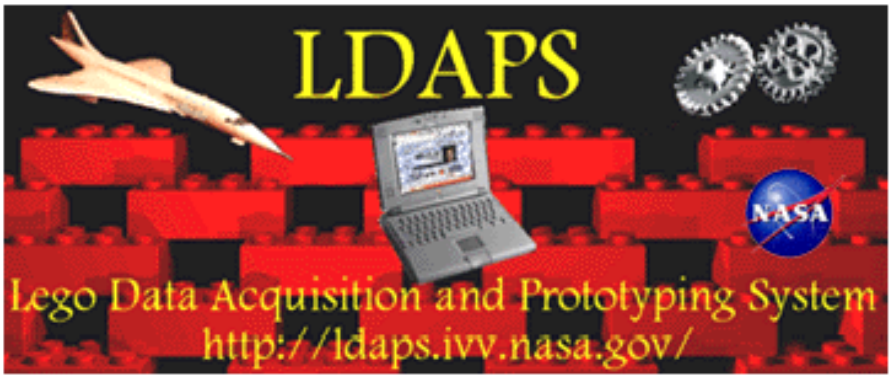
A World Wide Web browser with JavaScript or QuickTime support

Access

http://wings.ucdavis.edu

Additional Information

Please feel free to send comments or questions to:
buzz@cislunar.com
or
Jani Macari Pallis, Ph.D.
Cislunar Aerospace, Inc.
2030 Airport Road



The LDAPS Web site is an interactive, instructional, living document designed and written by teachers, elementary school students, college students, and university faculty. At the site, you can find out why a plane flies, what lift and drag are, learn how to build your own wind tunnel, sample curriculum ideas, and find creative ways teachers have brought engineering into their classrooms. You can also download software drivers for the LEGOs and link to a number of other educational sites.

The real goal of the people participating in this site is to help teachers integrate science into all aspects of their curricula, and to have a common thread throughout elementary science education. Teachers do this through teaching engineering as a motivator for learning math and science. The science and math may differ, but the engineering approach is the same for all years. For instance, one kindergarten teacher had the students design and build a town. They read books, drew maps, discussed what belongs in a town, and built it all with LEGO blocks, cardboard, and crayons. The end result was a town with three school buses (each stopping at a different set of houses), all computer controlled. One classroom built a space station,another built scenes from Charlotte's Web, and another group designed turkey traps. In each case, the kids were drawn in by the creative aspects of the design and construction, and were interested in the math and science since they directly affected the creation. As a result, kindergartners have argued with each other about the difficulties of frictional forces, the need for gears, and even written their own computer programs to control the LEGO creations.

System Requirements

A lot of LEGOs
Cardboard and scissors
A desktop computer (optional - if you want the computer to control the LEGO creations)

Access

All information is on the Web site: http://ldaps.ivv.nasa.gov/ Material needs: LEGOs (or other building toys), cardboard, tape, etc.

Additional Information

E-mail Ben Erwin at berwin@tufts.edu

Design of Accessible Web Pages

With the advent of the Internet, new accessibility issues have arisen for people with disabilities. In addition, Web technology is developing at an astonishing rate, making it difficult to anticipate trends in design of typesetting, browser, or server technology even a short distance into the future.

The purpose of InfoUse's document "Design of Accessible Web Pages" is to provide guidelines to serve as a resource for identifying problems and finding solutions that make Web pages accessible to people with a variety of disabilities, both independent of and in tandem with various types of adaptive hardware and software.

This document was funded in part as part of "An Internet Based Curriculum on Math and Aeronautics for Children with Physical Disabilities," Cooperative Agreement #NCC2-9011 with NASA's Information Infrastructure Technology and Applications program, a part of NASA's High Performance Computing and Communications Office. This document was also funded in part as a part of "Improving Access to Disability Data, a National Dissemination and Utilization Center," #133D50017 with the National Institute on Disability and Rehabilitation Research (NIDRR).

System Requirements

An Internet account
A World Wide Web browser (Netscape 2.x or 3.x recommended)

Access

http://www.infouse.com/disabilitydata/guidelines.html

Additional Information

Send e-mail to planemath@infouse.com

InfoUse in cooperation with NASA presents:

PlaneMath is a set of on-line lessons and activities that invites all children to experience the excitement, power, and fun of mathematics and aeronautics. The project targets 4-7th grade students in schools across the country. The on-line lessons and activities are specially designed to be accessible to students with a physical disability.

By accessing PlaneMath you will find:

- Twenty fun interactive lessons that follow National Council of Teachers of Mathematics (NCTM) standards for 4th - 7th grades - including explorations of aviation pio neers, role playing, cooperative learning, and the chance to design an airplane (with working wind tunnel and flight tests)
- Interviews with aeronautics professionals in a wide variety of fields
- Group activities for further practice of educational concepts
- Teacher pages that suggest strategies and additional resources for making the best use of PlaneMath
- Threaded discussion groups for teachers and students
- PlaneMath teacher registration for eligibility to win software prizes
- A community of teachers that can meet with PlaneMath staff via videoconference at Kinko's videoconference sites nationwide

Recognition for PlaneMath

- Listed at California Department of Education's SCORE Web site for recommended curriculum
- Selected as an Eisenhower National Clearinghouse on Math Digital Dozen web site
- Selected an an exemplary resource by the North Carolina Department of Public Instruction
- Included on a CD-ROM of outstanding Web sites by Classroom Connect, a publishing company of K-12 curriculum material on the Internet for classrooms
- Included in the Blue Web'n Learning Applications, "an honor reserved for the best instructional lessons, activities, projects, resources, references, and tools on the Web"

System Requirements

An Internet account and a World Wide Web Browser (Netscape 3.x or Internet Explorer 4.x recommended). Some activities require Shockwave.

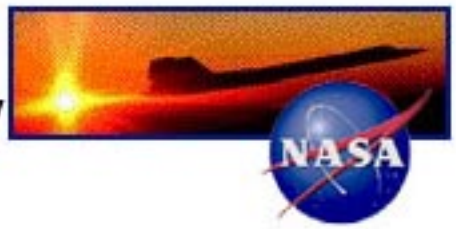
Access

http://www.planemath.com

Additional Information

Send Email to planemath@infouse.com

SHaring Aeronautics Projects Electronically



We use aeronautics to teach math and science. An aeronautics event is available for all learners. The event requires the integration of math and science concepts for the learner to make the necessary decisions to proceed through the event. The event is written at:

- Student Pilot level for grade K-4 learners
- Private Pilot level for grade 5-8 learners
- Ace Pilot level for grade 9-12 learners

We also feature:

- Open-ended Curriculum
  This curriculum gives educators hands-on activities to teach the math and science concepts that are required in the aeronautics event. The lessons are easily adapted to the ages and developmental levels of the learners.
- An Event Tutorial
  The tutorial informs educators and other learners about the basics of flight for the aircraft featured in the event.
- Event Aircraft Virtual Museum
- Teaching Strategies and Other Help Files

System Requirements

A World Wide Web browser

Access

SHAPE Web server (http://www.shape.k12.ca.us)
NASA Dryden mirror site for SHAPE (http://trc.dfrc.nasa.gov/shape)

Additional Information

Mail to Carey Brock (cbrock@qnet.com)
Project Manager

Idaho SPARK develops interactive, Web-based curricula that apply science and mathematics to real research and design problems, and meet local, state, and national standards for grades 9-12. SPARK's interactive activities allow students across the nation to participate in datashare activities and share results to extend learning. SPARK's curricula are designed and implemented with Native American, rural, and disadvantaged youth.

System Requirements

A World Wide Web browser

Access

http://nasaui.ited.uidaho.edu

Additional Information

Please contact: Kay Brothers at brothers@uidaho.edu
Or visit us at http://nasaui.ited.uidaho.edu

The satellite broadcast Take Off! Part II explores the exhilarating world of flight. It is designed to get students excited about math and science through an introduction to lift and drag, aircraft design, ballooning, weather, instrumentation, flight simulators, and navigation. During the seven satellite broadcasts, the course explores both basic science and its practical technology applications, and is intended to inspire students, especially those uninterested in traditional science and math classes, with the possibilities of careers in aviation.

The program is developed by the Massachusetts Corporation for Educational Telecommunications, in collaboration with the Federal Aviation Administration, New England Region, and faculty from the Aviation Department at Bridgewater State College.

System Requirements

Schools participating in the Take Off! Part II program need access to a steerable satellite dish able to downlink digital signals, and access to a phone, fax, or Internet to interact during and after live broadcasts. The school district must be a member of MCET's network.

Access

Registration and membership information are available at http://www.mcet.edu/products/learnpike.html

Additional Information

Visit http://www.mcet.edu/nasa/index.html
Send e-mail to franc@mcet.edu
Call (617) 252-5700 x740

NASA's Observatorium Web site is a fascinating Internet window to the best of NASA's Earth and space knowledge. It combines years of NASA exploration and discovery with the latest Web technology, giving visitors a site that is literally out of this world.

All your NASA favorites are here: Earth and space photos, The space shuttle, The Hubble Space Telescope, Planets, Comets, Black holes, Eclipses...a body of knowledge as vast and varied as the universe itself.

From the continually updated "Observation of the Week" to in-depth articles on NASA projects, both acclaimed and inconspicuous, NASA's Observatorium showcases the agency that personifies American spirit and ingenuity.

System Requirements

A World Wide Web browser (Some of the simulations and games require Java and Shockwave support.)

Access

http://observe.ivv.nasa.gov

Additional Information

Send e-mail to curator@observe.ivv.nasa.gov
Visit http://rspac.ivv.nasa.gov/

“Exploring the Internet with NASA” is a CD-ROM produced for the National Aeronautics and Space Administration (NASA) to introduce young students or first-time adult users to the Internet. You will discover what the Internet is, what it is used for, and gain hands-on experience navigating the World Wide Web.

The CD-ROM brings the excitement of the Internet to your computer and showcases the vast resources NASA and others make available via the Internet.

“ Exploring the Internet with NASA” is an entertaining multimedia experience. As an Internet explorer, you can take an exciting, futuristic journey through the universe in a souped-up Spanish galleon! You’ll visit strange worlds land-scaped with biosphere domes, mining operations, tree houses, and science labs. The inhabitants of these worlds are linked by the Internet, which now traverses the universe.

The program tells its story through a rich display of color illustrations, video clips, and 3-D animation. Music and sound effects complete the illusion that you’re traveling great distances as you explore the Internet.

The CD-ROM contains over 150 NASA publications for educators, students, and the public, as well as a sampling of biographies of pilots and images of planes from NASA’s Dryden Flight Research Center in Edwards, CA.

System Requirements

The CD-ROM runs under MacOS, Windows 3.1, Windows NT, and Windows 95

Access

If you would like to receive a copy of the CD-ROM “Exploring the Internet with NASA,” please send payment (in US dollars only) in the form of a check or money order, made payable to “TRW” to:
TRW-RSPAC
Attention: CD-ROM
100 University Drive
Fairmont, WV 26554
Cost of an individual CD-ROM (includes shipping and handling fees)
US $3.50 (US)
Canada $3.60 (US)
Mexico $4.50 (US)
All Other Countries $6.50 (US)

Additional Information

Visit http://cdrom.ivv.nasa.gov
Send e-mail to cdrom@observe.ivv.nasa.gov

IITA Legacy Projects

Digital Library Technology

Informedia: Integrated Speech, Image and Language Understanding
for Creation and Exploration of Digital Video Libraries

PI: Takeo Kanade

The Informedia interactive on-line digital video library system to be created by Carnegie Mellon University and WQED/Pittsburgh will enableusers to access, explore and retrieve science and mathematics materials from video archives. The Informedia system works by integrating speech, image and natural language understanding technologies. The library willinitially contain 1,000 hours of video from the archives of public television station WQED/Pittsburgh Electronic Field Trips on video from the Fairfax Co., Va., public school system and video course material produced by the BBC for the Open University, a British college without walls, with an enrollment of more than 200,000. Issues involving human-computer interaction, pricing and charging for digital video use, and privacy and security will be addressed as part of the research program.

System Requirements

A World Wide Web Browser

Access

http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information

kanade@cs.cmu.edu

Digital Library Technology

University of Michigan Digital Libraries Research Project

PI: Daniel Atkins
Project Director

This project will conduct coordinated research and development to create, operate, use and evaluate a testbed of a large-scale, continually evolving multimedia digital library. The content focus of the library will be earth and space sciences. Potentially connecting thousands of users and information repositories, the library system will be designed to meet the need for systemizing the vast amount of information on an array of topics available on the Internet. A critical component of the project is the testing and evaluation of the prototype system by a wide variety of users, including those from on-campus, local high schools and public libraries.

Responsible Official: Dr. Nand Lal, Project Manager

System Requirements
A World Wide Web Browser

Access
http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information
atkins@umich.edu

Digital Library Technology

The Stanford Integrated Digital Library Project

PI: Hector Garcia-Molina

The Stanford Integrated Digital Library Project will develop the enabling technologies for a single, integrated “virtual” library that will provide uniform access to the large number of emerging networked information sources and collections — both on-line versions of pre-existing works and new works that will become available in the future. The Integrated Digital Library will create a shared environment that links everything from personal information collec tions, to collections found today in conventional libraries, to large data collections shared by scientists. The research thrusts of the project include: information sharing and communication models; client information interfaces; and information finding services.

Responsible Official: Dr. Nand Lal, Project Manager

System Requirements

A World Wide Web Browser

Access

http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information

hector@db.stanford.edu

Digital Library Technology

The Alexandria Project: Towards a Distributed Digital Library with Comprehensive Services for Images and Spatially Referenced Information

PI: Terence A. Smith

Project Alexandria will develop a digital library providing easy access to large and diverse collections of maps, images and pictorial materials as well as a full range of new electronic library services. The project is centered at the University of California, Santa Barbara, with its major collections of maps and images and its strong research focus in the area of spatially-indexed information. It also involves the State University of New York at Buffalo (SUNY-Buffalo), the University of Maine and several industrial partners. The project will begin with collections of digitized maps, images and airphotos relating to Santa Barbara, Ventura and Los Angeles counties using software developed for geographical information systems. Over four years, the project will grow to include other components at UCSB, SUNY- Buffalo, Library of Congress, the United States Geological Survey and the St. Louis Public Library, as well as other interested libraries. Each site will include, as necessary, facilities for geographical information interfaces, electronic catalogues, and information storage and acquisition.

Responsible Official: Dr. Nand Lal, Project Manager

System Requirements

A World Wide Web Browser

Access

http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information

smithtr@cs.ucsb.edu

Digital Library Technology

The Environmental Electronic Library:
A Prototype of a Scalable, Intelligent, Distributed Electronic Library

PI: Robert Wilensky et al
Project Team

This project will produce a prototype digital library with a focus on environmental information. The library will collect diverse information about the environment to be used for the preparation and evaluation of environmental data, impact reports and related materials. The research prototype is intended for eventual full-scale deployment in the State of California's CERES production systems. To create the prototype, researchers will need to produce technologies which allow untrained users to contribute to and find relevant information in other world-wide digital library systems. Research areas include automated indexing, intelligent retrieval and search processes; data base technology to support library applications; new approaches to document analysis; and, data compression and communication tools for remote browsing.

Responsible Official: Dr. Nand Lal, Project Manager

System Requirements
A World Wide Web Browser

Access
http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information
wilensky@cs.berkeley.edu

Digital Library Technology

Building the Interspace: Digital Library Infrastructure for a University Engineering Community

PI: Bruce Schatz et al
Project Team

This project is based on the new Grainger Engineering Library Information Center at the University of Illinois in Urbana-Champaign and will be centered around journals and magazines in the engineering
and science literature. The testbed will include a customized version of NCSA Mosaic (TM), software developed at the National Center for Supercomputing Applications under NSF and DARPA sponsorship to help users navigate the World Wide Web. This testbed will become a production facility of the University Library with thousands of documents and tens of thousands of users across the University of Illinois
and other Big Ten universities. Research, based in the Graduate School of Library and Information Science, will encompass sociological evaluation of the testbed, technological development of semantic retrieval, and prototype design of future scalable information systems (the Interspace).

Responsible Official: Dr. Nand Lal, Project Manager

System Requirements
A World Wide Web Browser

Access
http://dlt.gsfc.nasa.gov/Projects/Abstracts/projectRDL.dhtml

Additional Information
bschatz@ncsa.uiuc.edu

Project Horizon has developed easy-to-use, scalable digital library technologies for the public to use to locate, integrate, access, and analyze Earth and space science data via the Internet. Horizon is serving scientific data to K-12 classes, as well as the general public and professional scientists.

System Requirements

World Wide Web Browser

Access

http://horizon.ncsa.uiuc.edu/

Space Science Testbed — The Astronomy Digital Image Library
http://imagelib.ncsa.uiuc.edu/imagelib/

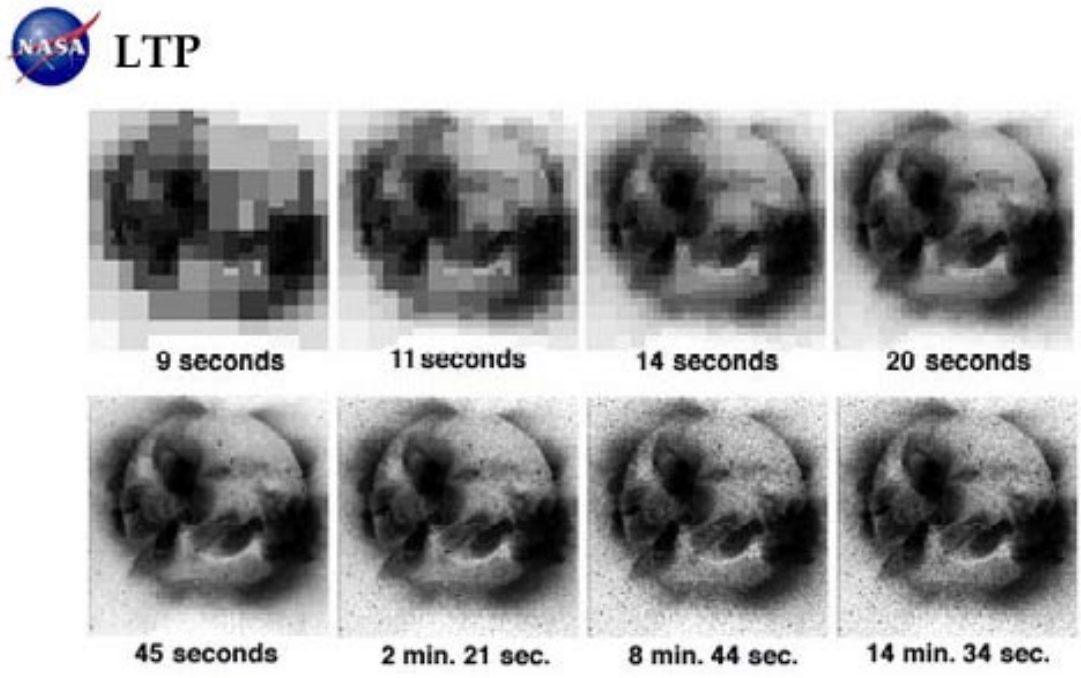
Earth Science Testbed — The Daily Planet(TM)
http://www.atmos.uiuc.edu/

Additional Information

Visit http://horizon.ncsa.uiuc.edu/

Send e-mail to mfolk@ncsa.uiuc.edu

Progressive Image Transmission:
Delivering large images over slow networks faster and better



X-ray image of the Sun from the Yohkoh satellite, courtesy of J. Lemen.

The Progressive Image Transmission (PIT) system delivers large digital images over slow networks in a small fraction of the time usually needed. Viewers get a good view in as little as 1/100th of the expected download time, at which point they can interact with the server by outlining rectangular regions of interest which will be delivered losslessly at a higher priority. The user controls the lossiness of the image, which is not chosen in advance by the server.

PIT supports twenty-four-bit true-color images, as well as sixteen-bit gray-scale data. The algorithms used are quantitatively well-behaved; the pixel statistics are preserved even for the early versions of the image. This provides good visual fidelity for general users and good numerical fidelity for professional users.

System Requirements

Unix workstation running IRIX, Solaris, or Ultrix

Access

For a demonstration copy, contact
Dr. Jeffrey W. Percival (jwp@sal.wisc.edu)
Space Astronomy Laboratory University of
Wisconsin - Madison 1150 University Ave. Madison, WI 53706 608-262-8686

Additional Information

“Space Update” is a information and imagery treasure trove CD-ROM produced by Rice University under National Aeronautics and Space Administration (NASA) funding. Designed for museums and schools, but now available to the general public, it provides “the best of the Web” safely, without the problems of a Web browser - the students can’t reach inappropriate sites or “get lost in cyberspace.” Yet it provides today’s earth and space imagery.

“Earth Views of Space and Space Views of Earth” - “Space Update” can run as a single integrated program on a modest personal computer. Alternatively, most of the modules (Astronomy, Solar System, Earth Today, Space Weather, Sky Tonight) can also run separately. Space Update includes each of those modules plus “What’s New,” which includes recent comet observations and tonight’s sky maps. Thus, one CD can give a museum or school six different exhibits - all fully field tested at the Houston Museum of Natural Science. The images all reside in your computer, so just point and click - no waiting to download!

Science isn’t static, so our system is designed to allow updates of the images: “Earth,” for example, shows today’s satellite photos and weather maps; “Space Weather” shows the Sun and aurora as it is today. You can browse or download today’s images from our web site. If you run our system on a personal computer with a static IP number, we can update your modules remotely and automatically each day (for a modest charge) or download today’s images free from the Internet to keep your software up to date!

Also included free is a “Cosmos Clock” screensaver, which counts down to 1/1/2000 (the launch of the IMAGE spacecraft or any date you choose). The countdown is both in Earth time, and in the rotations and revolutions of the planets. We also include a “Quicktime VR” panorama of the Mars Pathfinder site, and much more.

System Requirements

The multiplatform CD-ROM runs under MacOS, Windows 95/98, and Windows NT. The monitor size is 640 X 480; 16-bit color ("high color" on Windows systems), and 8 MB free RAM. The software can run straight from the CD or, for faster running (and the ability to update), the entire suite or any module can be copied to your hard drive. The Mac version includes scripts for one-button updating of the images. We give full site licenses - you may copy onto multiple machines.

Ordering Information

If you would like to receive a copy of "Space Update", please send check or money order, made payable to "Rice University." (Purchase orders and credit cards also accepted - fax a request to 713-285-5143.) The software has versions from 30, 45 and 60 degrees north latitude (for the "Sky Tonight" software) - Please specify the latitude which is closest to your location.

Ms. Norma Cowley
Department of Space Physics and Astronomy
Rice University MS 108
Houston, TX 77005-1892

Pricing (Contact us for prices for updating services and multiple copies.) Single-screen version: $25.00 (US) + $5 Shipping and Handling (specify the latitude desired)
Two-screen (museum version): $50.00 (US)

Access

Visit http://earth.rice.edu, or http://spaceupdate.com

Additional Information and online ordering

Send e-mail to connect@space.rice.edu
Updated June 11, 1999

Retrieval of Digital Images by Means of Content is a satellite image database which allows a user to retrieve images based on the characteristics (or content) of the image rather than the location (or metadata) of the image.

This database currently includes satellite images of the United States from the Thematic Mapper (TM), the MultiSpectral Scanner (MSS), and Synthetic Aperture Radar (SAR). The user can specify the characteristics of the retrieved image at the semantic level (forest, urban area, water), the feature level (texture), the raw pixel level (template matching), or a combination of the above.

The performance of the content-based access is improved considerably by applying a progressive framework to the data representation as well as the search strategy. A further description of the project can be found in our white paper.

System Requirements

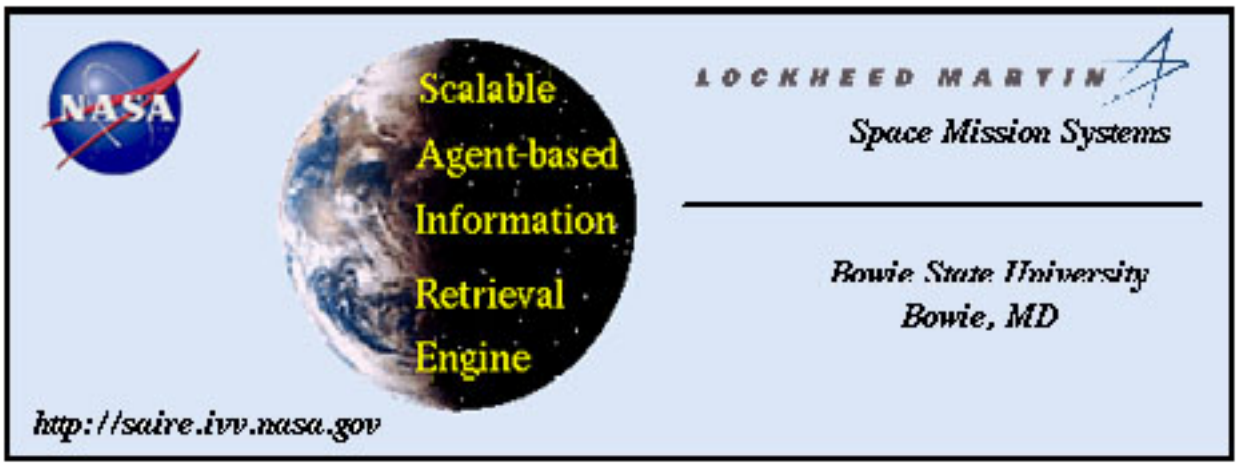
A World Wide Web browser (with Java support)

Access

http://maya.ctr.columbia.edu

Additional Information

Send e-mail to csli@watson.ibm.com



SAIRE, a Scalable Agent-based Information Retrieval Engine, is a multiagent search engine employing intelligent software agents, natural language (NL) understanding, and conceptual search techniques to support public access to Earth and space science data over the Internet.

SAIRE currently supports 7,000 terms and over 11,000 words in its Earth science dictionary, and retrieves information from distributed, heterogeneous data sources (such as the Global Change Master Directory (GCMD) and Distributed Active Archive Centers (DAAC) of NASA) via natural language input. SAIRE's agent groups collaborate with each other to properly satisfy user requests and support complex information retrieval processes.

SAIRE is currently being upgraded to provide these additional capabilities:

Interpreting user intentions and preferences
Concept-directed searches
Persistent query handling ability

System Requirements

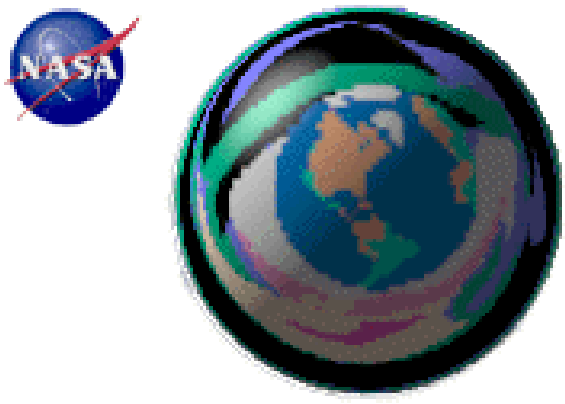
SAIRE can be accessed via a Java-enabled browser, such as the latest versions of Microsoft Internet Explorer or Netscape.

Access

http://saire.ivv.nasa.gov/

Additional Information

Point of Contact:
Bikas Das, PI, Lockheed Martin Space Mission Systems, Seabrook, MD 20706
E-mail: bdas@groucho.sms.lmco.com Phone: 301-805-0452 Fax: 301-805-0521
Collaborators:
Dave Kocur Stuart Weinstein (Lockheed Martin Space Mission Systems) Nagi Wakim, Sadanand Srivastava, and Chris Gokey (Bowie State Univ., Bowie, MD) Jid Odubiyi (British Telecom North America Inc., Reston, VA)



USDAC's GeoLens/GeoHarness System

"...innovative digital library technology that enables broader public use of NASA's Earth Observation System (EOS) data and makes NASA's imagery interoperable with other federal geospatial data."

Universal Spatial Data Access Consortium

The *GeoLens project* involves the evaluation of new Web/Internet technologies, support of federally mandated information processing standards, and use of public domain software to implement clients and servers. The USDAC's member organizations include Bell Communications Research, Camber Corp., Rutgers Center for Remote Sensing and Spatial Analysis, NASA's National Space Science Data Center, and the California Resource Agency. Recently, USDAC team members have also collaborated closely with technologists at the National Center for Supercomputing Applications (NCSA), University of Illinois.

The *GeoLens/GeoHarness* system consists of a *GeoLens client,* a *GeoHarness catalog/query server*, data access servers and, potentially, other servers to process geospatial data or their metadata. The current *GeoLens/GeoHarness* prototype includes:

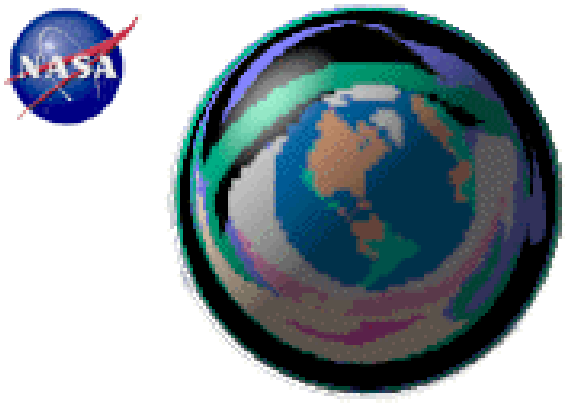
Support for dynamic schema (including FGDC and ECS metadata standards), translations between schemas, and recursive queries of *GeoHarness catalogs*

A full-feature scalable catalog server built on a commercial ODBMS

Data access servers that implement coverage types and interfaces consistent with those described in the *OpenGIS Abstract Specification*, and that return extracts of data objects

A Java-enabled client featuring a sophisticated graphical interface for viewing metadata trees and their attributes, and for forming map/image-based spatial queries

A client-server model implemented on *WWW-Internet* infrastructure



System Requirements

GeoHarness Server: Sun Solaris, Web server, O2 ODBMS GeoLens Client: Java-enabled Web browser

Access

Contact: Cliff Behrens, Principal Investigator
Phone: (201) 829-5198
E-mail: cliff@bellcore.com

Additional Information

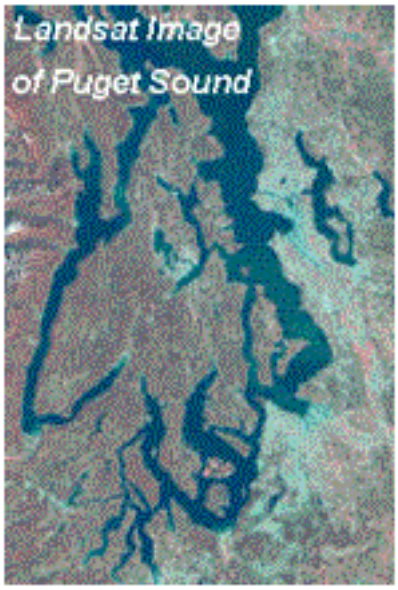
Send e-mail to cliff@bellcore.com
Visit the USDAC homepage at http://usdac2.rutgers.edu

Athena

Earth and Space Science for K-12

Athena offers online instructional material to K-12 students and teachers. Classroom projects require active participation as students learn; Teacher Talk aids teachers in its use. Using the Web, students access remotely sensed or real-time data in:

Space **Weather** **Earth** **Oceans**



Athena is a partnership of educators and scientists. Classroom teachers and scientists work together to create Athena materials, which are tested in real classrooms. Lessons are designed to improve scientific literacy and generate lifelong interest in science. These materials align with Washington State standards and complement existing curricula. Athena is a living project ready for teachers and students to add new lessons that suit their needs.

Science Applications International Corporation (SAIC) partners with

- Washington State's Office of the Superintendent of Public Instruction (OSPI)
- Bellevue Public Schools
- Lake Washington School District
- Northshore School District
- Seattle Public Schools

System Requirements

A World Wide Web Browser

Access - three mirror sites

RSPAC Aya - http://www.athena.ivv.nasa.gov
OSPI Warp - http://athena.wednet.edu
OSPI Inspire - http://inspire.ospi.wednet.edu:8001/

Additional Information

Principal Investigator Hugh Anderson, hugh@nw.saic.com (425-482-3310, SAIC/ Bothell, WA) OSPI Educational Telecommunications Supervisor Dennis Small, dsmall@inspire.ospi.wednet.edu

SAIC now maintains and augments the site. In 1999, its use continues to grow.

Bay Area Digital Geo Resource

The Bay Area Digital Geo Resource (BADGER) project provides low-cost public access to geographic data over the Internet for non-traditional users such as local governments, utilities, businesses and public organizations.

BADGER makes available a high-quality digital base map of the San Francisco Bay Area to serve as a common reference. From this, environmental features, property lines, and demographic information can be viewed in context with one another.

System Requirements

A World Wide Web browser

Access

http://www.basic.org

Additional Information

Adam Cohen
E-mail: adam.cohen@lmco.com

http://www.circles.org/

The Earth System Science Community (ESSC) includes educators, students, and scientists. The ESSC is refining an investigation- oriented Earth system science curriculum which enables high school and university students to research the Earth system using Earth observation data and information over the Internet.

The ESSC and the general public are using our data services to locate, visualize, and analyze Earth science data in their research of the Earth system.

Benefits

• Science Understanding. Students and educators learn how to investigate the Earth as a system using the appropriate scientific data, tools, and techniques.
• Scientific Communications. Students also learn how to evaluate and publish the results of their team re-search on the Internet.
• Knowledge Sharing. Scientists contribute their expertise, data, and research to the advancement of science education.
• Broad Applicability. Because ESS is inherently cross-disciplinary, thematerials, tools, teaching resources, and examples of student research published on the ESSC Web sites may be used to supplement existing curricula in Earth and environmen tal science, physics, chemistry, and beyond.

System Requirements

A World Wide Web browser

Access

http://www.circles.org/
http://www1.ecologic.net/avesda2/html

Additional Information

Michael Keeler, Principal Investigator

ECOlogic Corporation
19 Eye Street, NW
Washington, DC 20001
E-mail:keeler@ecologic.net
Phone: 202-218-4100
Fax: 202-842-5088

EMERGENCY AND CRISIS MANAGEMENT
A Remote Sensing Application

The Emergency and Crisis Management project uses remote sensing data for mitigation, preparation, response and recovery from natural and technological hazards. The project is also developing computer-based instruction for emergency managers and high school students.

The project assists disaster managers and communities (citizens, government agencies, businesses) by providing increased awareness of NASA technologies for disaster reduction.

This will in turn facilitate:

Improved opportunities for disadvantaged groups to prepare for disasters
Increased awareness of effective disaster management techniques
Reduced physical, social and economic losses from disasters
Improved community disaster capabilities

System Requirements

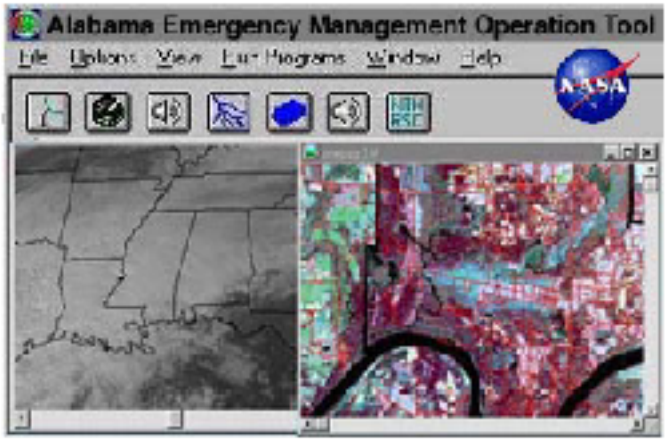
A World Wide Web browser (Some of the simulations require Java support.)

Access

http://www.ias.unt.edu:9876

Additional Information

David M. Neal, Director
Institute of Emergency Administration and Planning
University of North Texas
Denton, TX 76203
emproj@pearl.ias.unt.edu
817-565-4267 (voice)
817-369-8771 (fax)



The Emergency Management Operation (EMO) Tool is a graphical user interface for managing access to Internet image and text files, local data, and local applications. When it is used with ArcView GIS software, emergency managers can view and analyze floods on their PCs with remote sensing imagery to:

- Integrate satellite and aerial imagery with spatial vector data for roads, hospitals, shelters, etc.
- Use the satellite and aerial imagery to delineate flood boundaries geographically
- Include the new FEMA Q3 flood data for flood zones
- Build imagery archives for temporal analyses of flood prone areas.

System Requirements

The EMO Tool runs on PCs under Windows 3.1, Windows 95, and Windows NT. The remote sensing and GIS CD data sets are formatted for ArcView 3.0 software operating on a PC running Windows 3.1, Windows 95, and Windows NT.

Access

For assistance in satellite and aerial image processing and total remote sensing/ GIS system solutions, SENTAR can help you enhance the usefulness of your GIS data and help you integrate remote sensing data into your operations to better achieve your mission.

Contact Greg Romanowski or Greg Hodges:
SENTAR, Inc., 4910 Corporate Drive, Suite C, Huntsville, AL 35805
Voice: 205-430-0860 Fax: 205-430-0840

Additional Information

Visit http://www.sentar.com/NASA/
Send e-mail to: EMOTool@sentar.com

Equipped with his five senses, man explores the universe around him, and calls the adventure ***science.***
Edwin Powell Hubble

The goal of the Everyday Classroom Tools project is to infuse the Spirit of Inquiry into every school subject, so that students and teachers can approach learning as a lifelong exploration of the world around us. Toward this end, we have developed the Threads of Inquiry, an integrated, inquiry-inspiring curriculum framework that brings science and the Internet into the everyday life of the K-6 classroom.

The Threads of Inquiry are a connected set of science explorations rooted in the direct experience of our world. Topics such as shadows, light, day and night, time, and the change of seasons are presented in a free-flowing and relaxed manner that encourages investigation, experimentation, and questioning. Each Thread is based on a scientific principle and includes an activity description, a materials list, scientific background information, guidelines on age-appropriateness, and curriculum pointers from the National Science Education Standards. The Threads also help teachers make connections to other classroom subjects.

The Threads of Inquiry are freely available on the Internet and can be used in many ways: as a connected set of science lessons, as a way to integrate science with other subjects, or even as a means of organizing the whole school day around the Spirit of Inquiry. The Threads provide dynamic and open-ended support to elementary teachers who seek to bring the excitement of scientific inquiry into their classrooms. Hardcopy and CD-ROM formats are under construction and will be available before the start of the 1998-1999 school year.

System Requirements

Access to the Internet using a World Wide Web browser capable of viewing frames.

Access

http://hea-www.harvard.edu/ECT/
Hardcopy and CD-ROM formats are under construction and will be available before the start of the 1998-1999 school year.

Additional Information

Send e-mail to ect@head-cfa.harvard.edu

The Exploring the Environment Project features interdisciplinary modules that use satellite imagery as a tool, problem-based learning as a methodology, and the World Wide Web as a means of delivery. The project provides students with tools to investigate scientific, social, political, and cultural aspects of controversial, authentic, environmental problems. Most problems deal with human activity and its impact upon the environment, such as water quality, habitat destruction, or biodiversity. Standard problem-solving models, on-site resources (to include relevant satellite imagery), and recommendations for extended inquiry are made available to students. Student-directed research generally lasts a minimum of five weeks, but often extends throughout the semester. Working cooperatively, students engage in problem-based activities requiring them to formulate problem statements, collect and analyze data, then prepare and present their findings, solutions, or recommendations. The Exploring the Environment project supports teachers with online materials, summer workshops, and tools for expanding their repertoire of teaching and learning tools.

System Requirements

Requires access to the World Wide Web with a Macintosh, Windows, or Unix machine.
Requires Netscape or Internet Explorer versions 3.0 or later.

Access

The Exploring the Environment site is located at http://www.cotf.edu/ete

Additional Information

• Designed, developed, and implemented eighteen problem-based, interdisciplinary modules dealing with such topics as land use, endangered species, habitat destruction, natural hazards, and non-renewable resources.

• Provided tools for student-directed inquiry to hundreds of middle and high schools across the country and the world (over 10 million hits and 110 countries accessing the site).

• Established a mirror site to Schools Online Singapore.

• Used teacher input to refine and test the materials in fifty schools in the US and Canada during the 1996-97 school year.

• Published and presented numerous research papers concerning the design, development, and use of remote sensing in support of teaching and learning.

• Point of contact, Robert J. Myers, Ph.D., bmyers@cet.edu, (304) 243-2368

The Internet Weather Explorer (IWE) is a family of products resulting from the FIFE project which allows NASA data and information products derived from NASA-related sources to be combined with educational“context” to support elementary level weather education. Developed by Tasc, Inc., with help from Franconia Elementary School of Alexandria, VA, IWE is a way to create compelling multimedia weather lessons that combine live and stored Internet data and graphics with contextual information such as “What is a weather satellite?”

All products are based on a “lesson,” which is an interactive multimedia lesson file with built-in educator controls. Lessons are Macromedia Shockwave movies that can be created by the IWEAuthor tool. Many controls and structures have been developed, in part to help control group use of lessons in school computer lab environments.

WebIWE - A Netscape Navigator-based browser interface for “playing” the lessons
IWEAuthor - An authoring system for creating lessons, including a parts library and a GUI for creating and organizing lessons, creating interactions, and creating graphics and media
IWEPlayer - A stand-alone playback engine that will work even on basic Macintosh LC computers with small screens. The lessons can even be stored on floppy disks and play on “off-line” computers
IWECommunity - A virtual community with interactive discussion forums and chat rooms that allows students, educators, parents, and other interested individuals to learn about and use the system

System Requirements:

All: any color Macintosh or Windows 3.1, 95, NT, or later computer with QuickTime 2.0 or later
WebIWE: any Internet connection (such as AOL), Netscape Navigator 2.0 - 3.0, Shockwave plug-in
IWEAuthor: 14" or larger color screen, 8 MB RAM, 10 MB free hard disk space
IWEPlayer: any color screen, 4 MB RAM for Macintosh or Windows 3.1, 5 MB free hard disk space
IWECommunity - any Internet connection (such as AOL), Netscape Navigator 2.0 - 3.0

Access

(IWE homepage: http://www.erols.com/tascfes/fife/iwe/iwe.htm)
All parts can either be used in the Netscape Navigator browser or downloaded and run off a hard drive.
WebIWE: http://www.erols.com/tascfes/fife/iwe/webless.htm
IWEAuthor: http://www.erols.com/tascfes/fife/iwe/iweautho.htm
IWEPlayer: http://www.erols.com/tascfes/fife/iwe/webiwe.htm
IWECommunity: http://www.erols.com/tascfes/fife/iwe/iwecom.htm
“ Public” Entrance: http://www.erols.com/tascfes/fife/iwe/freeless.htm

Additional Information:

Contact Jeff Morse at jmorse@vertice.com for technical help in using this system.
Contact Dave Zink at dezink@erols.com for project management questions.

The University of Minnesota ForNet project has created ImageView, a World Wide Web-based system that allows users to browse large raster data sets, including Landsat Thematic Mapper (TM) and Ad-vanced Very High Resolution Radiometer (AVHRR) imagery. ImageView provides users who would traditionally have little or no access to such databases with the ability to visual-ize, manipulate, and download images for a particular area of interest. ImageView allows users to interactively explore an image or sets of images by setting parameters such as spatial extent, band combinations (where applicable), and display parameters (such as contrast). Working with sets of images, users can view landscape or seasonal variability in the imagery due to factors such as insect infestation, flooding, or human development. ImageView works from ERDAS Imagine image files and was developed using the Imagine C Programmer's Toolkit.

System Requirements

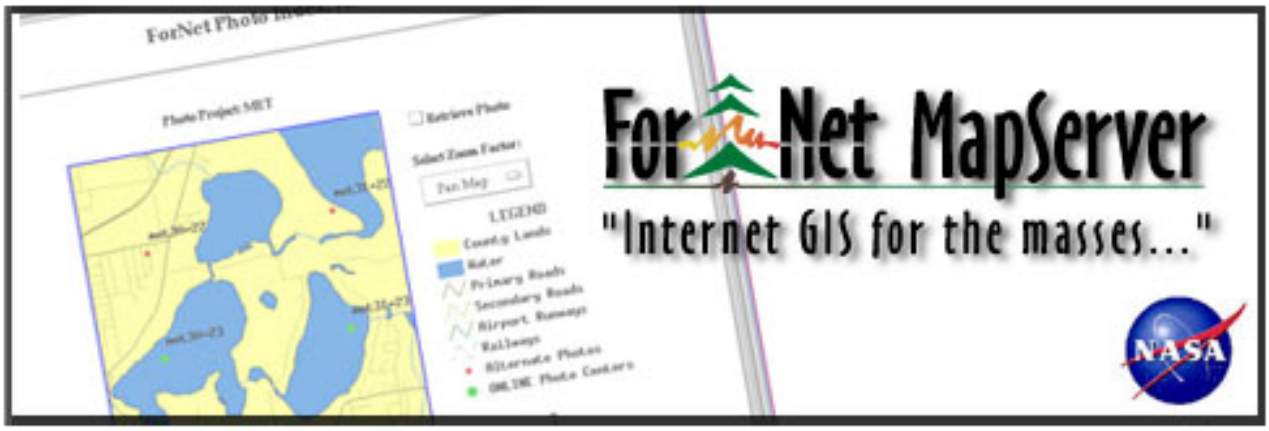
A World Wide Web browser. Some enhanced interfaces require Java and JavaScript support.

Access

http://www.gis.umn.edu/fornet/docs/ImageView/
Opportunities to access and apply the ImageView software to new data sets are also available.

Additional Information

Visit: http://www.gis.umn.edu/fornet E-mail: imageview@torpedo.gis.umn.edu
Dr. Thomas E. Burk University of Minnesota
1530 Cleveland Avenue
North St. Paul, MN 55108
Phone: (612) 624-6741



The University of Minnesota ForNet project has developed MapServer, a software package for bringing interactive maps and associated attribute data to the World Wide Web. MapServer uses Geographic Information System (GIS) databases as the basis for creating maps and reports. Data owners can provide access to data for users who have traditionally lacked the hardware and software necessary to store, manage, and access GIS databases. Users can access data as they choose, and are not limited to predefined views or “canned” summaries.

Map Server works with ESRI shapefiles and uses template files to describe map appearance and interface layout. Additional features include scale-dependent feature drawing, feature annotation, and automatic legend building.

System Requirements

Source code compilation requires an ANSI C compiler.
Software developed and tested under Sun Solaris 2.4. The basic system has been successfully installed on Sun (Solaris 1.x/2.x), SGI (IRIX 5.3), DEC, Pentium/ FreeBSD, and Windows NT platforms.

Access

Beta versions of the MapServer source code, applets, and documentation can be found at http://www.gis.umn.edu/fornet/docs/MapServer and may be down loaded freely.

Additional Information

Visit: http://www.gis.umn.edu/fornet
E-mail: mapserver@torpedo.gis.umn.edu
Dr. Thomas E. Burk
University of Minnesota
1530 Cleveland Avenue North
St. Paul, MN 55108
Phone: (612) 624-6741

The Gulf of Maine Aquarium WWW site focuses on K-12 applications of satellite imagery to teach about aquatic environments. Called Space Available: Learning from Satellites, this site includes over sixty classroom-tested activities, complete with learning objectives, background information, and links to relevant imagery. All activities are consistent with national learning standards in mathematics and science.

Upcoming additions include species-specific sites on lobsters, whales, seals, dolphins, and groundfish, as well as On Location: The Ultimate Field Trip. This program electronically connects students with aquatic researchers at remote sites via satellite-transmitted imagery and e-mail. Initial sites visited include Antarctica, the Galapagos Islands, and the Gulf of Maine. Upcoming visits will bring students face-to-face with tiger sharks off the Hawaiian Islands and blue whales in the Sea of Cortez.

System Requirements

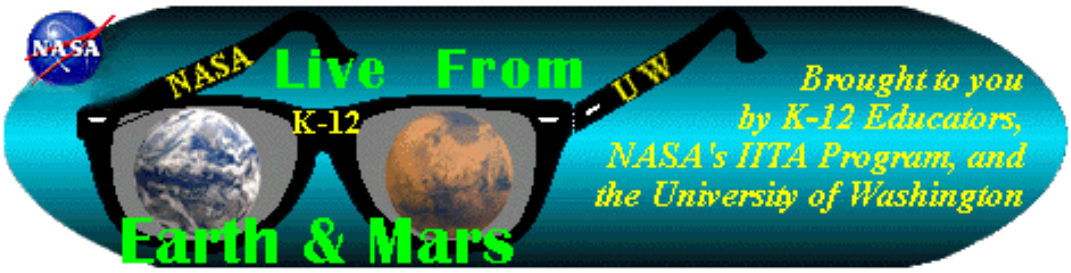
A World Wide Web browser

Access

http://octopus.gma.org

Additional Information

Send e-mail to www@octopus.gma.org



Live From Earth and Mars brings real-time and retrospective atmospheric and space sciences data to K-12 students, educators, and the public through elegant interfaces and engaging teacher-created curricula that exploit the power of the World Wide Web. These data provide excitement and new perspectives through their immediacy, importance, and ease of access. Special areas within the Web site are Earth, Mars, Teaching Tools,Workshop Materials, and Projects.

Climate and weather are featured in the Earth section of Live From Earth and Mars. Users query databases of live or archived atmospheric data through unique “inquiry engines” that facilitate personalized exploration. The results of queries are custom plots and their associated data sets by which users can explore trends in climate or weather, compare different climatic zones, or compare current weather patterns with climatic norms.

Mars features data and information about the surface of Mars, as observed by the Viking Mars landers, and Mars Pathfinder. Meteorological plots and tables are available along with background on the missions and instruments. Teaching Tools features curricula that use the power of the Internet to explore and build understanding of standards-based science and engineering concepts. Eight complete modules are currently available with others to be offered soon. Classroom-tested and kid-approved topics range from Virtual Sojourner (commanding a “rover” in a simulated Mars mission) to Let it Snow (capitalizing on personal experiences with weather). Kids are challenged to do the work of scientists, creating their own interpretations of real-time data. Teaching Tools presently offers fifty age-appropriate science lessons and engaging activities for grades 2-12.

The Live From Earth and Mars Education Team has presented numerous workshops on using data to teach science concepts. Workshop Materials makes the materials available in an online version for users, particularly teachers who want to gain understanding on how to teach using online data.

The Projects section features a modest but growing collection of submissions by students and teachers. These personal accounts of learning activities represent the diversity of interest and the power of learning the Internet supports.

System Requirements

A World Wide Web Browser (One Mars resource requires Java Support).

Access

http://www-k12.atmos.washington.edu/k12

Additional Information

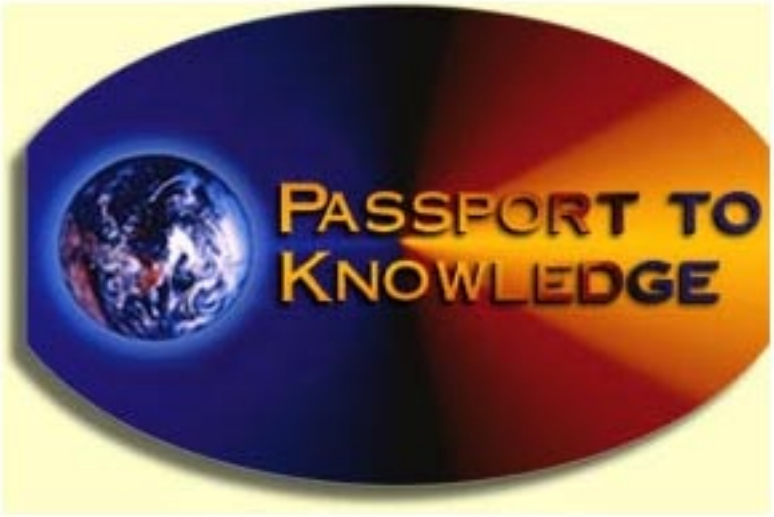
Send e-mail to Dr. Harry Edmon (harry@atmos.washington.edu)

PASSPORT TO KNOWLEDGE is an ongoing series of “electronic field trips to scientific frontiers.” Supported by the National Science Foundation, NASA, public television, and other collaborators, it encourages and permits students to interact with...

Real Science, Real Scientists, Real Locations, Real-Time

PASSPORT TO KNOWLEDGE uses broadcast TV, videotape, e-mail, the World Wide Web, and hands-on discovery activities so students can actively simulate the science seen on camera and online in their own classrooms. It’s flexible so that even teachers with limited time and technology can participate. Targeted at middle school students, activities can be adapted up or down in grade, and also provide connections to math, social studies, language arts, technology, and other disciplines, while meeting the National Science Education standards. Online discussion groups provide teacher-to-teacher support, as well as interactive projects for student-with-student collaboration.

PTK’s complementary video, print, and online materials allow students to relive these unique learning experiences at any time. Students experience the process of doing science — teamwork, problem solving, initiative, and persistence — along with learning about the latest breakthroughs. Online resources provide extensive background, first-person field journals, an archive of student questions and expert responses, and links to other sites.



PASSPORT TO KNOWLEDGE projects include the following *LIVE FROM* specials:

LIVE FROM ANTARCTICA
LIVE FROM THE STRATOSPHERE
LIVE FROM THE HUBBLE SPACE TELESCOPE
LIVE FROM MARS
LIVE FROM ANTARCTICA 2
LIVE FROM THE RAINFOREST
LIVE FROM THE POLES

System Requirements

VIDEO: TV or VCR
ONLINE: Internet access (viable via slow- or high-speed connection), e-mail or WWW
PRINT: Teacher's Guide, student worksheets, posters

Access

http://passport.ivv.nasa.gov
http://www.passporttoknowledge.com

Additional Information

1-800-626-LIVE (PTK HelpLine: 1-800-626-5483)
PASSPORT TO KNOWLEDGE
P.O. Box 1502, Summit, NJ 07902-1502
vox: 908-598-0949 / fax: 908-277-9590
e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

LIVE FROM ANTARCTICA integrates video, print, and online materials to provide a comprehensive and exciting interactive multimedia learning experience connecting students to Earth's most remote and mysterious continent.

Through **LIVE FROM ANTARCTICA**, students visit McMurdo Station, home of the US Antarctic program, the Dry Valleys, and America's Amundsen-Scott South Pole Station. They get a student's-eye view of astronomy at the very end of the world, see fish who live in sub-freezing waters, and spend time with the men and women who live and work in the most extreme conditions on Earth.

System Requirements

VIDEO: TV or VCR (four 60-minute programs)
ONLINE: Internet access (viable via slow- or high-speed connections), e-mail or WWW
PRINT: Teacher's Guide, student worksheets, and NSF background: $20.00

Access

http://passport.ivv.nasa.gov/antarctica

Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

LIVE FROM ANTARCTICA 2 integrates video, print, and online materials to provide a comprehensive and exciting interactive multimedia learning experience connecting students to Earth's most remote and mysterious continent.

LIVE FROM ANTARCTICA 2 travels across the Drake Passage, the roughest seas on the planet, to the National Science Foundation's (NSF) Palmer Station to study giant elephant seals and week-old Adelie penguins, and to track global climate change.

System Requirements

VIDEO: TV or VCR (three 60-minute programs)

ONLINE: Internet access (viable via slow- or high-speed connection), e-mail or WWW

PRINT: Teacher's Guide, student worksheets,poster, and NSF background: $20.00

KIT: includes guide, worksheets, poster, oversize USGS map, a 90-minute teacher orientation video, NSF pamphlets, UV filters, and more: $99.00

Access

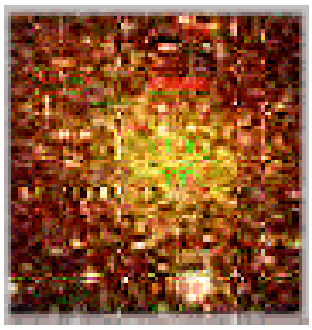
http://passport.ivv.nasa.gov/antarctica2

Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

A unique opportunity for students to explore space and cyberspace

LIVE FROM THE HUBBLE SPACE TELESCOPE features another educational first: students helped select targets for the Hubble Space Telescope, humanity's most powerful eye on the heavens. Actively mentored by professional astronomers, students debated online and chose to assign one orbit to Pluto and two to Neptune. The observations and results were presented during live broadcasts from NASA's Goddard Space Flight Center and the Space Telescope Science Institute.

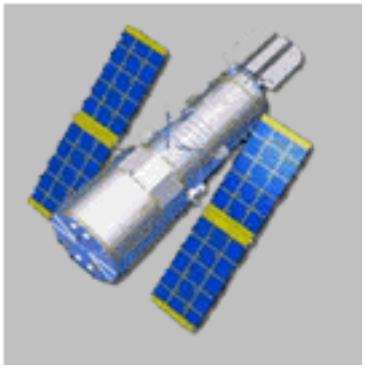


System Requirements

VIDEO: TV or VCR (two one-hour segments and one half-hour segment)
ONLINE: Internet access (viable via slow- or high-speed connection), e-mail or WWW
PRINT: Teacher's Guide packs include Hubble color lithographs and sample experimental materials (such as spectroscopic glasses, UV-sensitive beads, heat-sensitive paper,etc.), and may be ordered from PTK: $20.00

Access

http://passport.ivv.nasa.gov/hst



Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

LIVE FROM MARS tracks NASA's two current missions to the red planet using video, the Internet, and hands-on activities to allow students to simulate the work of the mission team and bring Mars down to Earth!

"Countdown" takes students to Cape Canaveral - into a high-security clean room for the final pre-launch preparations for *Mars Pathfinder*, and onto the pad to witness the launch of *Mars Global Surveyor.***"Cruising Between the Planets"** updates the missions and visits NASA's Jet Propulsion Laboratory, home to America's robotic solar system exploration program. Students go behind the scenes during rehearsals for *Pathfinder's* July 4, 1997, landing, and explore the geology of Mars. Special programs during **"Mars Week"** (July 4-12) and fall 1997 continued the project through the landing and into the new school year. An online collaborative project, the **"Planet Explorer Toolkit,"** provides **"Mystery Site"** challenges which invite students to analyze climate and other data from around the world and to solve science puzzles.

System Requirements

VIDEO: TV or VCR (PBS and NASA-TV)
ONLINE: Internet access (viable via slow- or high-speed connection), e-mail or WWW
PRINT: Teacher's Guide, student worksheets,poster, and NASA background: $20.00
KIT: includes Guide, a 60-minute teacher orientation video (including "Mars the Movie," Martian meteorite news release, computer graphics of both missions, and more), an original 20-slide set, a CD-ROM ("Mars Navigator"), the "Mars Explorer" map/poster, and more: $99.00

Access

http://passport.ivv.nasa.gov/lfm

Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

A PASSPORT TO KNOWLEDGE SPECIAL

Debuting as part of NSF's 17th annual National Science and Technology Week, whose theme this year is: POLAR CONNECTIONS: EXPLORING THE WORLD'S NATURAL LABORATORIES.

LIVE FROM THE POLES was aired live on participating public television stations and NASA-TV (subject to shuttle missions and other agency events) at: **13:00** hours **Eastern, Tuesday April 28, 1998.**

During the live broadcast of **LIVE FROM THE POLES**, a panel of researchers individually answered e-mail questions submitted during the program, and for the hour immediately following. Most questions were answered right away, and the entire "onair" archive of questions and answers can be accessed online. View the onair questions and answers that were sent during the broadcast.

LIVE FROM THE POLES featured real-time interaction between students in the US and researchers at America's South Pole station, and also between youngsters at the Imaginarium in Anchorage, Alaska, and scientists and polar experts from the Smithsonian's Arctic Studies Center and NSF's Office of Polar Programs, live on camera in Washington, DC, at the National Museum of Natural History. Viewers of the live program were also able to send in questions via the Internet and have them answered in close to real time during the program and for the hour following. Documentary sequences from the Smithsonian's unparalleled film archive of Arctic peoples and places, and from PTK's two field seasons in the Antarctic showed the similarities and differences of these two unique and fascinating environments. Yupic elder Paul John explained, through a translator, something of the meaning of the clothing and art work of the North, and Arctic Studies Center director, William Fitzhugh, showed close-ups of canoes and hunting tools. From the South Pole, Katy Jensen answered questions about the ozone hole, and students met many others of the 28 hardy souls spending the southern winter at the literal end of the Earth. Viewers saw science and technology at work—both the traditional knowledge of the North which has made human survival here possible for millennia, and the innovations which have allowed 20th Century explorers and researchers to be able for the first time to endure the extremes of Antarctica. Science and technology with a human face—REAL SCIENCE, REAL SCIENTISTS, REAL LOCATIONS, REAL TIME.

System Requirements

A World Wide Web Browser

Access

LIVE FROM ANTARCTICA (LFA): http://passport.ivv.nasa.gov/antarctica/
LIVE FROM ANTARCTICA 2: http://passport.ivv.nasa.gov/antarctica2/

(Students may be particularly interested in reading Field Journals in LFA from Katy McNitt, Katy Jensen's former name.)

Additional Information

For a free NSTW Teacher's Guide, contact NSF via e-mail at nstw@nsf.gov, or go online to find an NSTW regional site near you.
http://www.nsf.gov/od/lpa/ nstw/

Extensive background on the Antarctic may be found on the sites originally developed to support two earlier PASSPORT TO KNOWLEDGE electronic field trips,

Visit the Amazon basin and other rainforests.

LIVE FROM THE RAINFOREST (LFRF) explores the most diverse and concentrated areas of life on our planet — the Amazon basin and other rainforests. It brings the Life and Earth sciences, and remote sensing to the classroom through video, hands-on, and online activities. Students get to know the scientists through chat sessions, television programs, and online field journals. There is even the opportunity to participate in an online collaborative project that will provide an incentive for students to get out and conduct field research in their own environments. Experience one of the most dramatic and interesting environments on Earth!

System Requirements

VIDEO: TV or VCR (three one-hour programs that will debut. April 7, 14, and 21, 1998: "Mission to Planet Earth," "Worlds Beneath the Canopy," and "Connect Globally, Act Locally")

ONLINE: Internet access, viable via slow- or high-speed connection, e-mail, or WWW

PRINT: Teacher's Guide Pack includes a 80-page guide featuring hands-on activities, special PTK full-color LFRF poster, student worksheets, and more: $20.00

MULTIMEDIA KIT: Includes the Teacher's Guide Pack, a teacher resource video with rainforest background and segments demonstrating how to implement hands-on activities via classroom demonstrations, sample online materials, a set of 35 mm slides,and more: $125.00 Advance orders may be placed by calling 908-273-4108. Packs will be shipped when available in late February.

Access

http://passport.ivv.nasa.gov/rainforest/

Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com
Check 1-800-626-LIVE for updates!

A unique opportunity for students to explore space and cyberspace

LIVE FROM THE STRATOSPHERE gives students their first chance ever to ride — virtually — aboard NASA's Kuiper Airborne Observatory and observe planets, stars, and galaxies with an infrared telescope. An advanced NASA satellite provides a real-time video link from takeoff through landing. The adventure climaxes with a five-hour "Night Flight to the Stars," during which students "camp in" at schools and science museums across the country, interacting with the airborne astronomers via live TV and the Internet.

System Requirements

VIDEO: TV or VCR (five programs of various lengths: 30 minutes, 1 hour, 2.5 hours, 5 hours, and a compilation/wrap-up of 1 hour)
ONLINE: Internet access (viable via slow- or high-speed connections), e-mail or WWW
PRINT: Teacher's Guide packs include Hubble color lithographs and sample experimental materials (such as spectroscopic glasses, UV-sensitive beads, heat-sensitive paper, etc.), and may be ordered from PTK: $20.00

Access

http://passport.ivv.nasa.gov/lfs

Additional Information

e-mail: ghaines@quest.arc.nasa.gov or ptkghs@aol.com

Science Education Gateway

K-12 science education resource center for teachers, students, homeschoolers, and all science fans. You'll find learning adventures in Earth and space science from a NASA-sponsored partnership of museums, researchers, and educators. Choose from wide-ranging lessons, tutorials, interactive tools, and activities organized by topic.

System Requirements

Frames version of SEGway is optimized for Netscape 3.0 or equivalent.
Frameless version of site is available.
Some resources require plug-ins: QuickTime movie player, RealAudio Player, Java.

Access

http://www.cea.berkeley.edu/Education/SII/SEGway provides access to all materials and to sites at partner institutions which host their own resources. There are also links to other sites in the Science Information Infrastructure.

Additional Information

SEGway resources are produced in cooperation with centers of basic research, science museums, and K-12 educators. Partners include:

Exploratorium
Lawrence Hall of Science
National Air and Space Museum
Science Museum of Virginia
Center for EUVE Astrophysics
Center for Earth and Planetary Science
Smithsonian Astrophysical Observatory
Space Telescope Science Institute
EOSAT
PacBell/CalREN

Contacts:

Dr. Carol Christian
Principal Investigator and Program Director of Technology
Hubble Space Telescope Science Institute
carolc@stsci.edu

Dr. Isabel Hawkins
Program Director of Education
Center for EUV Astrophysics/UC Berkeley
isabelh@cea.berkeley.edu

Anne Miller-Bagwell
SII West Coast Coordinator
Center for EUV Astrophysics/UC Berkeley
annem@cea.berkeley.edu

TiSDat is a suite of decision support information products for agriculture that merge satellite and meteorological data and forecast models of the atmosphere and land surface. Much of the technology is transferable to other crops and applications, and additional products are now in development. Our current product set includes:

Daily Insolation and Evapotranspiration Estimates:
Values of daily insolation (solar energy amounts) are produced from hourly GOES satellite images. They are of value for solar energy applications, crop modeling, weather and climate studies, and estimating crop water use (evapotranspiration). Currently, we are producing daily insolation values for the eastern United States and California. TiSDat's evapotranspiration product is an estimate of daily water use by irrigated crops, and is used by managers to decide when and how much water must be applied to maintain full productivity with minimal excess drainage to groundwater. We are currently estimating daily evapotranspiration for irrigation managers in Wisconsin, Minnesota, Ohio, and Florida.

Frost Prediction:
Low temperatures are potentially devastating to Wisconsin's cranberry crop throughout the growing season. A key factor in the low temperature experienced in a bog is cloud cover. Near real-time estimates of cloud cover obtained by satellite are combined with surface and upper-air meteorological data in state-of-the-art forecast models to predict whether freezing temperatures will occur overnight. The models make it possible to estimate air temperature, wind speed, and humidity, both above the crop and within the canopy.

System Requirements

A World Wide Web browser

Access

http://bob.soils.wisc.edu/nasacan.html or
http://cimss.ssec.wisc.edu/ag/ag.html

Additional Information

Send e-mail to diak@macc.wisc.edu or wlbland@facstaff.wisc.edu

The Urban Environment Initiative (UEI) provides non-traditional users of Earth science information with technologies that allow them to collect, visualize, and analyze information about the urban environment. This information is then used to answer a wide range of questions important to urban planners and decision makers. UEI works in conjunction with community-based partner organizations to conduct workshops and training sessions about remote sensing information and technologies.

System Requirements

A World Wide Web browser

Access

http://muspin.gsfc.nasa.gov/Prime

Additional Information

Sal Majied, PI Prime Technologies Service Corporation
7201 Wisconsin Avenue
Suite 480 Bethesda, MD 20814
E-mail: prime@interramp.com
Phone: (301) 907-7972 Fax: (301) 907-0981

Virtually Hawaii contains a large collection of satellite, aircraft, and ground images of Hawaii. We show near real-time GOES weather satellite images of the entire state, tutorials on the analysis of remote sensing data, interactive Quick TimeVR panoramas from several islands, and games. One of the most popular features is our “What’s New on the Volcano?” section, that is focused on the activity at Kilauea Volcano on the Big Island.

Our primary target audiences are tourists who are planning to visit Hawaii and the interested layperson who wants to know more about the islands and remote sensing. Other site visitors include K-12 students writing papers, undergraduates using our data for research projects, and local industries and state offices who draw on our wall-to-wall satellite coverage of the Islands provided by our “Image Navigator” function to study numerous areas and features.

Special sections, such as our “Virtual Field Trips,” allow visitors to travel around many different places in Hawaii. Quizzes are provided for several sites to challenge the visitor. There is even a “Guest Book” where anybody can leave comments about the presentation!

System Requirements

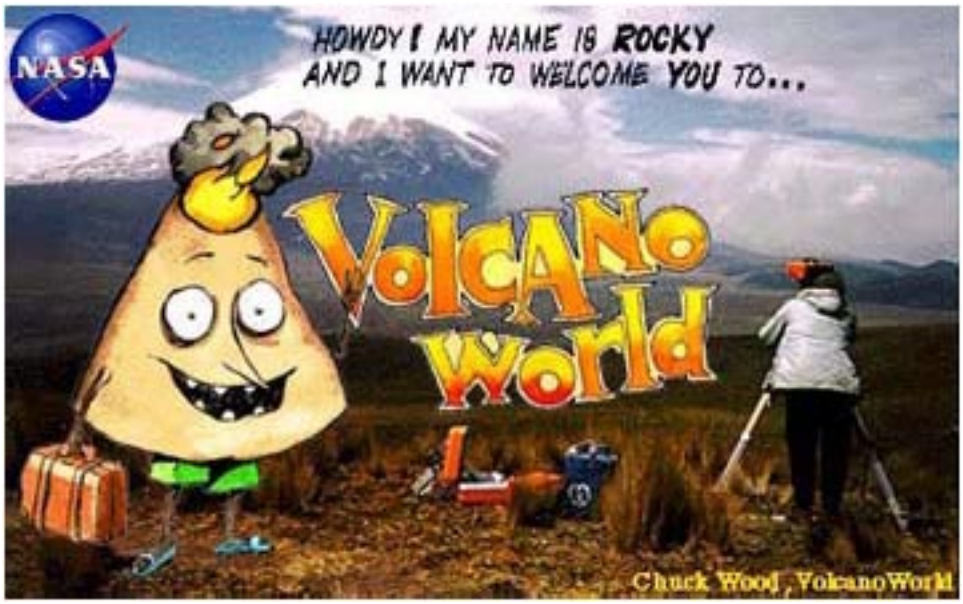
A World Wide Web Browser

Access

http://www.soest.hawaii.edu/SPACEGRANT/index.html
http://virtual1.pgd.hawaii.edu/goes/hawaii/latest.shtml

Additional Information

pmm@pgd.hawaii.edu



Volcanoes are one of the most dramatic phenomena in nature, attracting millions of visitors each year to US national parks and fascinating millions of children in school science courses. VolcanoWorld greatly enriches learning by delivering high-quality remote sensing images, information, and interactive experiments, which add depth, variety, and currency to existing volcano information sources.

VolcanoWorld brings modern and near real-time volcano information to school kids and other users of the Internet. VolcanoWorld draws extensively on remote sensing images (AVHRR, Landsat TM, Magellan, space shuttle, etc.) and other data collections. We add value to these data by relating each image to geologic processes, and by encouraging users to ask professional volcanologists questions.

System Requirements

A World Wide Web browser

Access

http://volcano.und.nodak.edu

Additional Information

Dr. Charles A. Wood Space Studies Department Univ. of North Dakota
E-mail: cwood@badlands.nodak.edu

NBC4 & NASA Team up to Produce a Whole New World of Weather...

WeatherNet4 is a first-of-its-kind project involving NASA and a broadcast television station. The intent is to increase the American people's exposure to Earth and space science data via the Internet and broadcast TV. It has proven that the television meteorologist/ weathercaster is indeed a "Science Ambassador," ready to deliver Earth and space science information daily to those watching television. By using state-of-the-art technology and communications, NBC4 WRC-TV in Washington, DC, has established the most comprehensive local Web site dedicated to weather and Earth and space science. Innovative visualizations of weather have motivated many Americans to get connected to the Internet in the Washington, DC, area and across the nation. This increases the use and public awareness of NASA and NOAA data and information tremendously.

WeatherNet4 Provides:
Educational Resources / Real-Time Weather Database / Interactive Satellite Images / Weather Data Archives / Community Interaction / Online Bulletin Board / Weather Games / Recreational Weather Resources / Web Weather Watchers / Special Skywarn Training Classes / StormTrack4 / Severe Weather Updates / What's New in Space & Science / Space Weather Page / Ski Net / Mountain Net / Homework Helper / Document Distribution via Adobe Acrobat / On-Air Weather Quiz / RealAudio Weather Forecasts/ Observation of the Week

Welcome to WEATHERNET4

System Requirements

WeatherNet4 can be accessed via the Internet. Computers should be equipped with the proper Internet browsing software.

Access

http://wxnet4.nbc4.com

Additional Information

WeatherNet4 & Dave Jones have been featured in The Washington Post, TV Week, Communications Week Magazine, Insights (NASA publication), USA Today, WeatherWise Magazine, Netscape's What's Cool. We have received numerous Web awards and been named an NBC Site of the Week. Additional collaboration is very likely with NASA, universities, and corporations throughout the country. Commercial applications of remote sensing data are currently being investigated.

To find out more about WeatherNet4 and its many applications, contact:

Dave Jones, Meteorologist, Principal Investigator
4001 Nebraska Ave., NW - Washington, DC 20016
Phone: 202-885-5069
e-mail: dave.jones@nbc.com

The Windows to the Universe CD-ROM is a product that allows greatly improved access speeds for the Windows to the Universe Web site, especially for users with slow Internet connections The CD-ROM contains most of the graphics, movies, audio clips, and multimedia presentations. These components of the Web site are loaded locally, rather than from the Internet. A feature of this product is that it is not a “stand-alone” product. It still requires a connection to the Internet.This allows the user to obtain new and updated information immediately from the Web site as it is being added to the Web site, rather than waiting for a new CD-ROM to be released. This means that the user gets the dual benefits of the fast access provided by the CD-ROM and current updated information via the Internet.

System Requirements

Windows 95, 16MB RAM (A monitor resolution of 1024x768 at 256 colors is suggested.) Windows 3.1x is not supported. Macintosh, Power PC 6100 mini mum. Higher resolution screens are suggested, but not required. UNIX platforms are not supported.

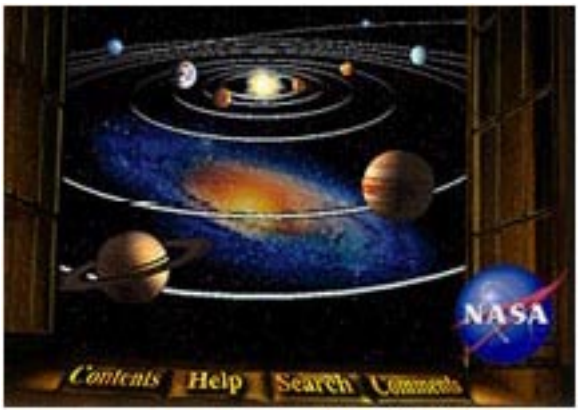
Access

Specify the platform, Macintosh or Windows 95. Send your name and address to:
Windows to the Universe Project
Attn: Windows to the Universe CD-ROM
Space Research Building, Room 1432
2455 Hayward Ann Arbor, MI 48109-2143
Visit our site at http://www.windows.umich.edu or our mirror site at http://windows.ivv.nasa.gov

Beta-test copies are currently available free of charge (for a limited time) in return for agreement to participate in evaluation activities.

Additional Information

Contact rmjohnsn@engin.umich.edu



Windows to the Universe is a user-friendly learning system for the general public. The objective is to develop an innovative and engaging World Wide Web site that presents current information about the Earth and space sciences. To achieve this goal, we are building a site that includes a rich array of documents, images, movies, animations, and data sets that explore scientific knowledge about our solar system, the universe, and the physical sciences. It also highlights the historical and cultural ties between science, exploration, and the human experience.

Our Web site has several key aspects. Content is available at three levels of sophistication intended to reflect elementary, middle, and high school levels. We are highly focused on making the information attractive, accessible, and interesting to users within each content level. The information can be presented in framed and unframed versions, allowing each person using the site an opportunity to tailor the presentation in a way that is most intuitive for them. Content on the site is guided by the curriculum needs of pre-college classrooms, as expressed in science content standards documents such as the National Science Education Standards and the Michigan Essential Goals and Objectives for Science Education.

Users can explore Earth and space science and their connections through standard HTML documents or through tours which constrain users to follow a concept to its conclusion. Supplementary CD-ROMs that provide rapid access to most images on the site (rather than requiring downloading from the Internet) are available for Macintosh and Windows 95 platforms. This results in much faster access to the information on the site, as well as access to current information as it is added to the site.

System Requirements

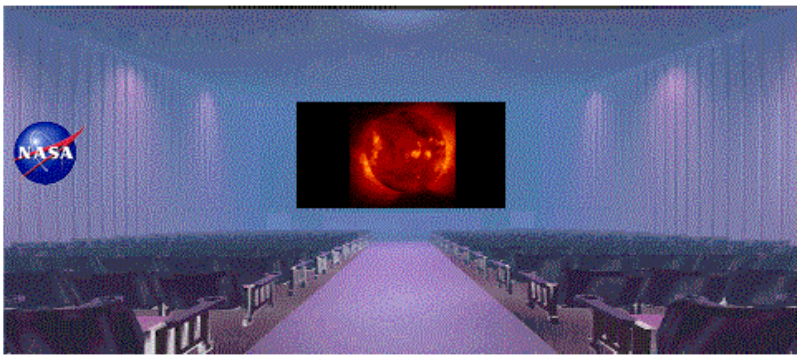
The Web site is accessible from any platform and Web browser, but is designed for Netscape 3.0. To run the site using a supplementary CD-ROM, we require: Windows 95, 16MB RAM (A monitor resolution of 1024x768 at 256 colors is suggested.) Windows 3.1x is not supported. Macintosh, Power PC 6100 mini mum. Higher resolution screens are suggested, but not required. Supplementary CD-ROMs are not available for UNIX platforms.

Access

Visit our site at http://www.windows.umich.edu or our mirror site at http://windows.ivv.nasa.gov

Additional Information

For additional information please contact rmjohnsn@engin.umich.edu



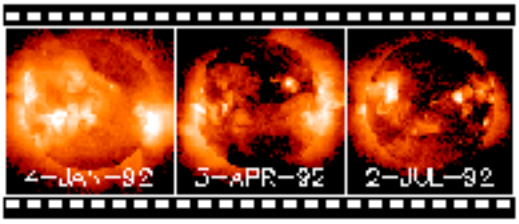
The Yohkoh Public Outreach Project (YPOP) is an Internet-based project designed to create high-quality public access to Yohkoh/SXT and other solar data. An additional and equally important component of this project is to provide educational products for dissemination to the K-12 community. These products utilize all available technology and comprise interactive lessons aimed at increasing the public awareness of science with a strong emphasis on astronomy and the space sciences.

Benefits:

- Public Outreach. Access to current solar data and research results make science available to the general public for education and experimentation.
- Promote NASA programs. Increase public awareness of NASA's international scientific programs.

YPOP Highlights:

- Classroom
- Film Festival
- The Sun Today
- Five Years of Solar Movies Online



Classroom activities include:

- Construct a Filter Wheel
- Build a Model Satellite
- Make Your Own Sun-dial
- Study Solar Cycles
- Yohkoh Public Outreach Project

System Requirements

YPOP is a World Wide Web-based project and is available over the Internet

Access

YPOP is accessible from two mirrored sites:
http://www.space.lockheed.com/YPOP/
http://solar.physics.montana.edu/YPOP/

Additional Information

PI: Dr. James R. Lemen,
lemen@sag.lmsal.com
Visit the YPOP Theatre!